DECEMBER 2, 1996 VOLUME 13, NUMBER 49

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Buyer's Guide

Management tools that help you keep an eye on your Web servers. Page 40.

THE GRAYING OF MICROSOFT

By Sandra Gittlen
Redmond, Wash.

Once full of pizza-eating, Jolt-slugging recent college grads, Microsoft Corp. has turned into a population of 34.3-year-olds looking to settle down and start families.

The "graying" of Microsoft has been evidenced by the recent celebration of the company's 20th anniversary and founder Bill Gates' 40th birthday, his marriage and the birth of his daughter, Jennifer Katharine, in April.

Marriage and family were never words synonomous with Microsoft. The company built its image as a lean, hungry competitor that demanded long hours and excellence of its employees, leaving the rank and file with little

See **Microsoft,** *page 60*

PHOTOS COURTESY OF MICROSOFT ARCHIVES

UUNET plans to go the 'extranet' mile

By Denise Pappalardo
Fairfax, Va.

UUNET Technologies, Inc. next week will introduce a service that will let companies open up their intranets to suppliers, customers and remote employees.

The Internet service provider's "extranet" service, to debut at Fall Internet World '96, will also make it easier for customers to manage their private Webs.

Key to the service is a device UUNET will install at customer sites to provide security and let customers prioritize intranet traffic based on where it is coming from and where it is going. While details about the device

See **UUNET,** *page 59*

Go online for more.

- ● **A graphic on extended intranets**
- ● **An article on quality-of-service guarantees becoming standard**

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VPN rates on the way down

Long-haul carriers feeling pressure to lower business prices.

By David Rohde

Long-distance carriers have become embroiled in an all-out bidding contest that is driving down negotiated virtual private network (VPN) rates to as low as 5 cents a minute — at least for customers willing to hand over voice *and* data traffic to one carrier.

The carriers are apparently spooked not only by the prospect of competition from local exchange carriers, but also by the dramatic emergence of voice telephony over packet data networks.

"The nickel minute is here," exulted Washington, D.C.-based user attorney Hank Levine, speaking at a Communications Managers Association convention in New York.

Amazingly, the bidding war on new contracts is taking place in the face of ongoing price increases on existing contracts. For example, on Thanksgiving Day, AT&T raised most of its business rates on regular tariffs by 4.8% (see story, page 15). The resulting whipsaw effect favors customers that renegotiate with carriers while hurting those that don't.

Carriers are making things easy for customers. "[All of the carriers are] contacting us — more so in the last month than we had been [contacted] all year," said Jeff Hafer, telecommunications manager at GPU, Inc., a utility holding company in Reading, Pa.

The offers are appearing on bids for the on-net to off-net traffic on traditional VPNs, such as AT&T's Software Defined Network (SDN) and MCI Communications Corp.'s Vnet, plus other services that map a company's private calling patterns onto a carrier network.

Such "on/off" traffic originates on a company's dedicated access lines but terminates at a switched access location, such as a customer's home or business.

The benchmark on/off price

See **VPN,** *page 14*

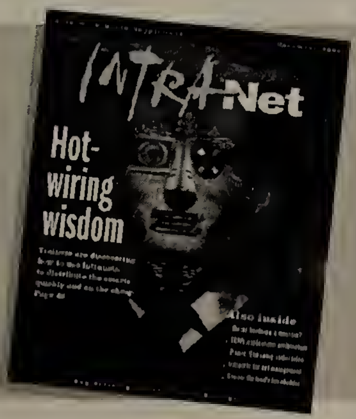
HOW TO DRIVE A HARD VPN BARGAIN

- Negotiate virtual private network (VPN) rates together with those for data, conferencing and Internet access services.
- Resist pressures by your CFO to get the lowest possible rate today in exchange for a term contract of five years or more. VPN rates next year may well drop.
- Establish a minimum annual commitment in dollars to the carrier. But keep it constant through the term of a multiyear contract.
- Take advantage of unusual access offers, such as AT&T's Terminating Switched Access Arrangement. This arrangement saves AT&T up to 3 cents a minute in fees to your RBOC-savings that can be split with you.

In this issue:

- **Tackling training**
- **Primer: Streaming video/audio**
- **A peek inside servers**
- **TRW's applications architecture**
- **Review: Borland's IntraBuilder**

Starts after page 32.



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Access Network World Fusion using the number in yellow. See page 5 for details.

Oracle to offer Java database query technology to rivals

By Ellen Messmer and John Cox

If database vendors have their way, complex queries will be done a whole new way — the Java way.

At this month's Internet World, Oracle Corp. is expected to reveal a Java-based method for performing complex searches against its upcoming Oracle Version 8.0 relational database.

Sources said Oracle wants to make its Java "stored procedures" a standard that anyone, even rivals, can exploit.

It will not be alone in the Java game. Rivals IBM and Informix Corp. are on the verge of shipping new databases that support their own style of Java-stored procedures, raising interoperability concerns.

In addition, Sybase, Inc. strongly hinted that it, too, is prepping its own flavor of a Java

See **Oracle,** *page 59*

On top of Internet World

Check out a roundup of upcoming announcements from Novell, start-up Aquas and others.
Page 8.

IT'S AN INTER

IT'S A FILE AND PRINT

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In other words, it's the first platform that's versatile and flexible enough to run your business on—today and tomorrow. To find out more about the ProLiant 2500 or Distributed Access, visit us at www.compaq.com/us, or call 1-800-319-7778 to locate the Compaq reseller near you.

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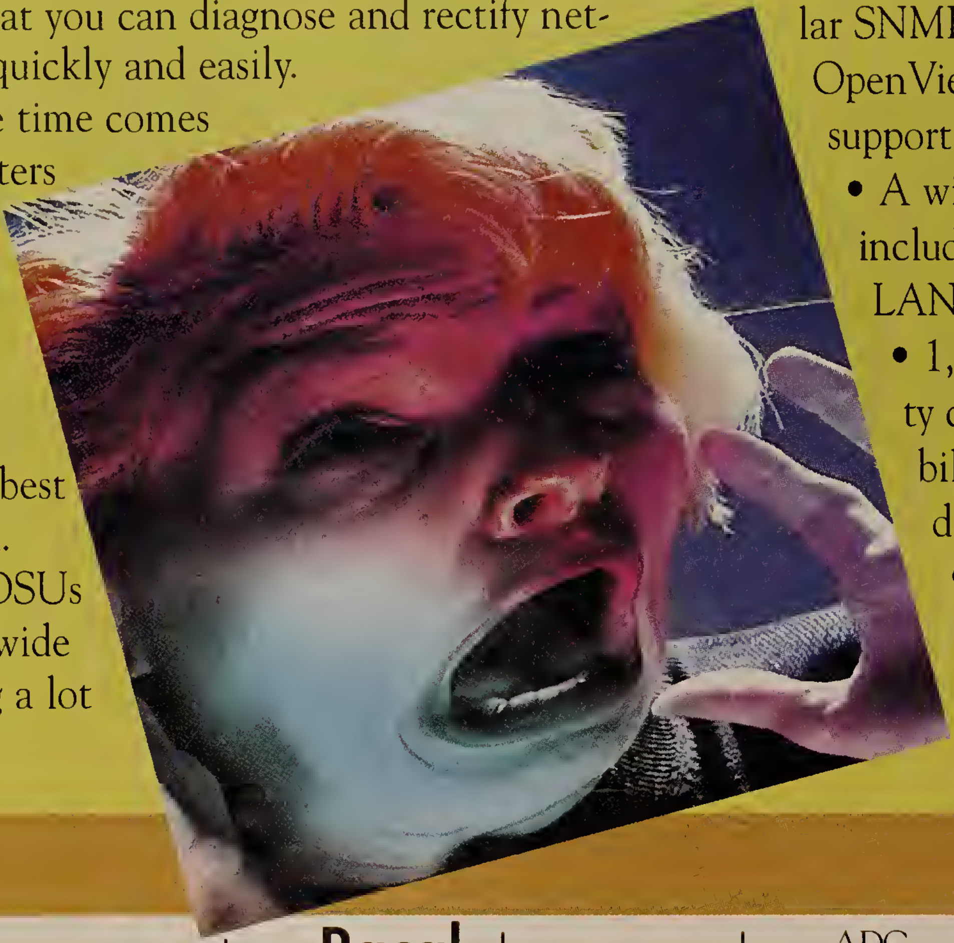
Wide Area Networking Can be a Scary Thing.

Protocol encapsulation, configuration nightmares, performance issues, security concerns... just to name a few. And just try troubleshooting and managing this mess with something not designed from the ground up precisely for this purpose.

When it comes to your wide area network links, you can't afford to be clueless. **Racal's** family of T1/fractional T1 CSU/DSUs can handle anything your wide area router networks throw at it. They were designed expressly to provide you with critical visibility to your wide area network links so that you can diagnose and rectify network problems quickly and easily.

So when the time comes to link your routers over a wide area network, stick with a respected, dedicated company which has your best interest at heart. **Racal** ™ CSU/DSUs will help make wide area networking a lot less scary.



Racal CSU/DSUs offer proven performance, unrivaled capabilities:

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- **Racal** network management applications provide helpful graphical displays, making it easy to analyze management information. Applications available for most popular SNMP platforms: HP OpenView™-Unix®, HP OpenView-Windows™, and NetView®. Full TELNET support included.
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DTE data ports available	1, 2 or 4	1, 2 or 4	1 or 2	1, 2 or 5	1, 2 or 4+
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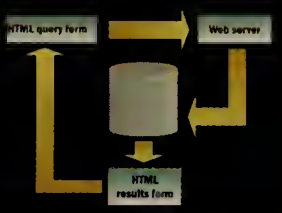

Object databases are in demand by customers rolling out Web applications. Page 32.

INSERT DOLLAR, SURF 'NET

Find out how to go online for spare change in 'Net Buzz. Page 8.

EXPLORING NEW WORLDS

AT&T's Gail McGovern pontificates on frame relay, bundling and, of course, the 'Net. Page 21.

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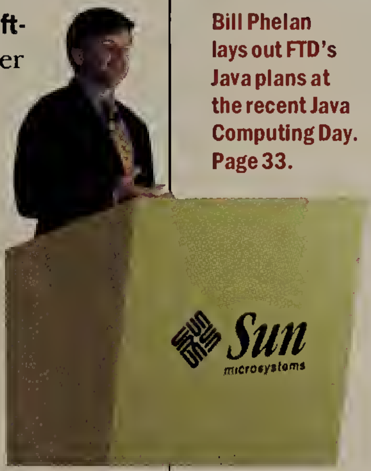

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This Week

Only on Fusion

- We take some of Seagate's new ultrafast Cheetah drives out for a spin and discover that those higher RPMs will really make your file servers purr. Download Network World Server Test Lab Director Bill Rinko-Gay's exclusive report. **DocFinder: 5213.**

News+

- **Microsoft:** What would an article about Microsoft employees be without some excerpts from Douglas Coupland's *Microserfs?* Read – and listen to – segments from the book, look up every key moment in Microsoft history, and see how Bill Gates spends his time. **DocFinder: 5210.**
- **Virtual private nets:** As carriers cut the costs of virtual private networks (page 1), Nortel says its ATM switch could eliminate the need for VPNs altogether. Read up on the switch and see a couple of VPN user case studies. **DocFinder: 5212.**
- **Carrier services:** Grab the complete transcript of our interview with Gail McGovern, an AT&T executive vice president. **DocFinder: 5202.**

NetRef

- **Web management:** Our buyer's guide to Web management apps (page 40) will get you started in this increasingly vital field. Link to Fusion for a downloadable version of our features and pricing chart and get detailed advice from a Webmaster. **DocFinder: 5204.**

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News briefs, December 2, 1996

Compaq: One million served

Compaq Computer Corp. has announced the shipment of its one millionth server, in this, its seventh year of server sales. The company is the first to pass the million-server mark, according to research firm International Data Corp. (IDC) in Framingham, Mass. IDC data showed Compaq's shipments of X86-based servers surpassed combined shipments from IBM, Hewlett-Packard Co. and Digital Equipment Corp over the same time period. The one millionth server, a Compaq ProLiant 5000, was delivered to Partners HealthCare Systems, Inc. in Boston by Compaq President and Chief Executive Officer Eckhard Pfeiffer.

Compaq's *CEO Pfeiffer with one millionth server.*

Sun thinks globally about clustering

■ Sun Microsystems, Inc. has reached an agreement to purchase Thinking Machines Corp.'s GlobalWorks software, which administers and manages clustered servers and distributed hardware as a single system. Sun hopes GlobalWorks will give it an edge in high-performance computing markets such as engineering and financial analysis, where large server clusters are more prevalent.

Management mixture I

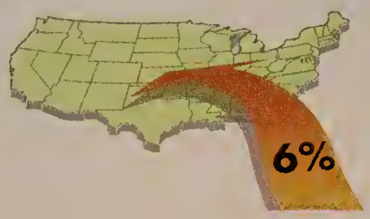
■ Computer Associates International, Inc. and Cabletron Systems, Inc. last week announced that their respective management products are now interoperable. Users of either the Cabletron Spectrum or CA-Unicenter platform can now gain access to the functionality provided by the other, the companies said. Specifically, Spectrum can be accessed from a CA-Unicenter client, and CA-Unicenter can be accessed from a Spectrum client. Also, alarms, events and management actions can be passed between the two platforms.

Management mixture II

■ Start-up MainControl, Inc. this week will announce an agreement to integrate Hewlett-Packard Co.'s OpenView Network Node Manager and Intel Corp.'s LANDesk management products to its MC/Empower distributed management platform. MC/ Empower lets companies track the purchase of hardware and software throughout a workstation's life cycle.

A fair trade for users

■ Network managers can bank on savings of up to 6% on foreign-made computer, network and telephone equipment, following a breakthrough in global trade talks. President Clinton last week won a commitment from the 18-member Asia-Pacific Economic Cooperation forum to eliminate information technology import duties over the next three years.



To take effect, the agreement still must be ratified by the World Trade Organization at its meeting later this month in Singapore.

FCC seeks to knock down high international rates

■ The Federal Communications Commission last week gave U.S. carriers a way to negotiate lower rates with foreign carriers to complete international connections.

The FCC action could eventually lower customer costs by allowing U.S. carriers to disregard a complicated set of international net-settlement arrangements that have helped keep rates high. Initially, the new FCC guidelines will apply only to traffic bound for countries with competitive telecommunications markets, such as Canada and the U.K.

Novell gains modest but encouraging

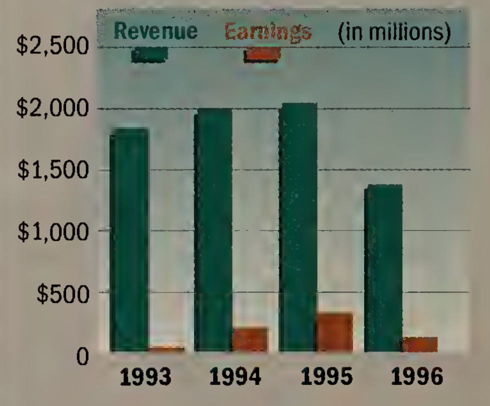
By Christine Burns
Orem, Utah

It's all in how you look at the numbers.

Despite a 20% drop in revenue compared with the same quarter last year, Novell last week put on a happy face about the modest profit gains it made for the final quarter of its 1996 fiscal year.

NOVELL'S NUMBERS SAY A LOT

Novell officials attributed the drop in fiscal 1996 earnings and revenue to the selling off of its UnixWare and WordPerfect businesses.



This was a year of transitions for Novell as the company shed unprofitable business units and got back to its networking roots. Additionally, Novell has undergone major executive changes and has had to fight off industry perception that its late entry into the intranet market has given Microsoft Corp.'s Windows NT a mind-share edge.

"We've taken hard actions to turn this company around, and what we accomplished this quarter represents progress," Novell Chief Executive Officer John Young said.

Novell earned $59 million on revenue of $383 million for the quarter ended Oct. 26. For the same quarter last year, Novell's revenue topped $480 million, with profits weighing in at $58.9 million.

The $100 million drop in revenue is a direct result of sell-offs including WordPerfect and UnixWare, said James Tolonen, Novell's chief financial officer.

Scott Reamer, a financial analyst at Cowen and Co. in Boston, said that even considering the revenue loss from these sales, the numbers are lower than industry expectations. "We are looking for substantial revenue growth in their core business, and that's not happening," he said.

The 1996 fourth-quarter numbers do represent a $19 million, or 5%, increase in revenue growth over the previous quarter based on the retained businesses.

"There are a lot of companies out there that have invested a lot of time and money into their Novell networks, and continued sales speaks to the continued credibility of those products," said Cheryl Currid, president of Currid and Co. in Houston.

On the annual balance sheet, Novell ended the year with $1 billion in the bank vs. $1.3 billion last year.

Tolonen said the company over the past 12 months repurchased 33 million shares of its stock for a total of $450 million.

"We are confident in the direction this company is heading, and we effectively put our money where our mouth is," Tolonen said.

©Novell: (801) 429-7000.

Informix, IBM take databases to new level

By John Cox
New York

Informix Software, Inc. this week will become the first mainline database vendor to release a hybrid offering that can handle complex data types, such as images, text and HTML documents,in addition to the numbers and letters usually stored in relational databases.

However, Informix and its new Informix Universal Server (IUS) will have company at DB/ Expo here, where the announcement will take place. IBM plans to use the show to announce DB2 Universal Database, which will handle complex data, incorporate IBM's parallel query option, and run on a wide range of multiprocessing computers and different operating systems.

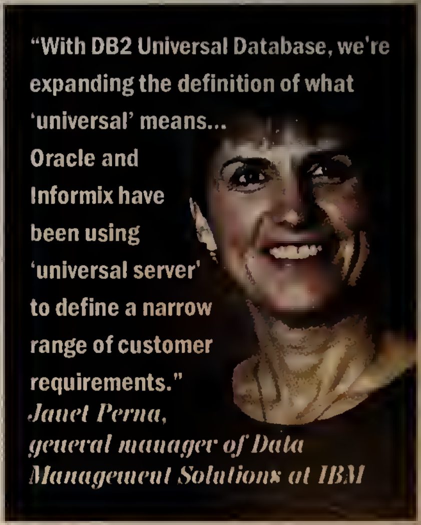
Both analysts and vendors envision such products being used initially for managing text and HTML information, often as part of public or private Webs. It is likely to be some time before the new database products are entrusted with the traditional, mission-critical class of business applications.

IUS blends Informix's modular, highly parallel relational database engine with object-relational technology acquired from Illustra Software, Inc. The Illustra technology lets developers create plug-in modules, called DataBlades, that run as part of the core database engine. The DataBlades let the database "run" on different types of data, such as images, text, HTML documents and spatial coordinates.

At this week's announcement, about 20 software vendors will unveil 25 new DataBlade modules that will be available when IUS ships at the end of this month, initially on Sun Microsystems, Inc. and Silicon Graphics, Inc. Unix computers.

IBM has shipped a beta version of DB2 Universal Database to a number of its hardware partners and will extend the beta program in coming weeks, said Janet Perna, IBM's general manager for data management solutions. The product will likely ship in mid-1997.

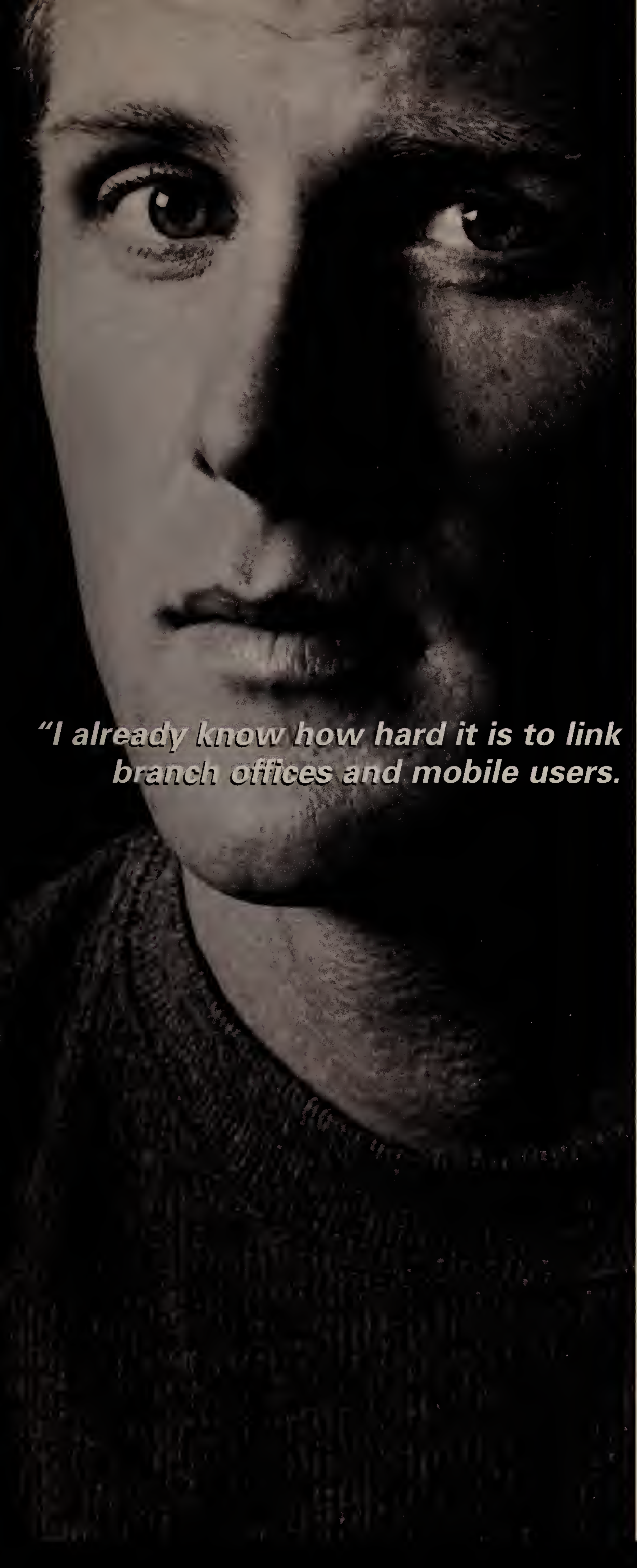
The heart of the new product is the engine in the current DB2 Version 2, which has had a set of multimedia extenders for text, audio and other data types since mid-1995. Software developers can create new data types and define new functions or operations that can be performed on them. IBM has written and sells several of these extenders, as well.



"With DB2 Universal Database, we're expanding the definition of what 'universal' means... Oracle and Informix have been using 'universal server' to define a narrow range of customer requirements."
Janet Perna, general manager of Data Management Solutions at IBM

This engine will be merged with the parallel query feature and the ability to run on a much wider range of non-IBM hardware and operating systems.

©IBM: (800) 426-2255; Informix: (415) 926-6300.



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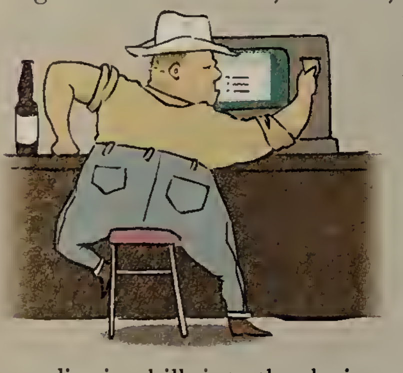
'NET BUZZ

The latest on the Internet/intranet industry.

By Chris Nerney

IT'S A DOLLAR A RIDE, DUDE You're in an airport, a sports bar or a shopping mall, and you are overcome with an insatiable desire to get online. These days, unless you lug around your laptop, you're out of luck.



Now **Surfing Devices,** a Vermont start-up company, has come up with a pay-per-use public Web access station it is touting as the "pay phone for the Internet."

BuckSurfer looks less like a public phone than an ATM machine – a notable difference being that users are slipping bills into the device rather than taking them out. Running off a high-speed Pentium processor and Windows 95 operating system, BuckSurfer connects to the Internet through a 28.8K bit/sec modem.

Undeterred by potential high tides, BuckSurfer is targeting many of the same markets – hotels, airports, libraries, cafes and bars – as the suddenly trendy network computer. One would presume it already has the beach market wrapped up.

A CACOPHONOUS COMMUNITY **OnLive Technologies, Inc.** has announced the availability of a server that allows large groups of people to socialize and otherwise communicate over the Internet using their own voices.

The patent-pending multiuser client/server voice technology used in the OnLive Community Server 1.0 enables groups of people to talk in real time using their own voices. Even clients with paltry 14.4K bit/sec modems can make themselves heard, though they hardly should be taken seriously.

Prices run from $2,295 for a 15-person server to $8,895 for a 75-person server. If it's just you and your little inner circle, you can download a five-voice server from the company's Web site (www.onlive.com) for free through Jan. 31.

OnLive Technologies, founded in 1993, is located in Cupertino, Calif.

SEQUEL TO THE SEQUEL **Sequel Technology Corp.** of Bellevue, Wash., said it will begin shipping a new version of its Sequel Net Access Manager at the end of this month.

Net Access Manager is designed to manage and report Internet, intranet and online usage. Sequel officials say that Version 1.5 features extensive use of wizards for easy reporting, as well as improved performance over the edition released earlier this year.

The product runs on SQL 6.5 and Windows NT 4.0, and can be configured for any network, according to Sequel. Pricing information was not available.

JUST THE FAX Two Cambridge, Mass.-based Internet start-ups have announced an agreement to package their flagship products.

VirtuFlex Software Corp. said it will include **NetCentric Corp.'s** FaxStorm technology with the VirtuFlex Web development software. VirtuFlex spokesperson **Sara Shapiro** said this will allow developers to use only one command to integrate faxing capabilities from a Web site, avoiding the need for elaborate Common Gateway Interface scripts.

Released in October, VirtuFlex 1.1 runs on Unix workstations and is priced at $795 through year-end and $995 thereafter.

Harboring deep secrets about Internet and intranet companies and products? Well, 'Net Buzz has ways of making you talk. Contact Chris Nerney at cnerney@nww.com or (508) 820-7451.

Novell to shine up IntranetWare

Start-up Aquas to debut Web management tool at Fall Internet World.

By Christine Burns, John Robinson and Carol Sliwa
New York

Novell, Inc. will use the Fall Internet World '96 conference here next week to showcase improved 'Net capabilities within its IntranetWare product line.

While the company declined to provide specifics, Novell said it will outline a number of significant enhancements to the Web server that ships with IntranetWare, the Web-enabled version of NetWare announced earlier this year.

Sources said this revised Web server could include some electronic commerce capabilities, extended support for database APIs for better access to distributed dynamic data, and new security and management tools that take advantage of Novell Directory Services.

Novell officials are also expected to release pre-beta code that will enhance the speed, security and Internet access capabilities of future versions of IntranetWare. All of these components all expected to be included in Moab, the next release of IntranetWare scheduled to ship in the first quarter of next year. The company will be delivering these capabilities as an expansion to its Early Access Program an-nounced in September.

Also at the show, Internet start-up Aquas, Inc. of Sunnyvale, Calif., will make its debut and unveil its first product BazaarAnalyzer.

Intended to be the initial offering in a suite of products, BazaarAnalyzer is a 'Net monitoring tool written entirely in Java. It can assess the effectiveness of commercial Web sites by tracking up to 12 parameters, such as the number and duration of hits, specific pages accessed, user demographics, disk usage and bandwidth. The data collected is displayed in graphic or table forms.

The software, which can be accessed by anyone with a Java-enabled Web browser from any location, runs on Unix and Windows NT. It costs $699 per server, regardless of the number of end users.

Privately held Aquas was founded in 1995 by Nitin Komawar and Sandip Chintawar, who had previously started software companies in their native India. Steve Shank, Aquas' vice president of marketing and sales, was founder and president of Symantec Corp.

Other show news will include:

- ■ Scotts Valley, Calif.-based Thuridion will demonstrate its CREW Internet/intranet groupware suite, originally slated for release in August. The suite includes a card file, scheduling calendar and messaging system, among other features. The CREW user interface pages are generated through Netscape Communications Corp.'s Navigator or Microsoft Corp.'s Internet Explorer, with no platform-specific client software needed.
- ■ NetCarta Corp., also of Scotts Valley, will debut a new version of WebMapper, its server software for managing Web sites. WebMapper 2.0 will include a new data viewing option that posts links on a spinning globe on a Web page. The option was designed to prevent users from having to scroll through screens of text. WebMaster also allows site administrators to track changes and publish easy-to-read maps for users scanning their pages.

☎Aquas: (408) 737-7122; NetCarta: (408) 461-8920; Novell: (801) 429-7000; Thuridion: (408) 439-9800.

Cisco taking aim at IBM network management

By Michael Cooney
Raleigh, N.C.

Continuing its efforts to win over the hearts of large SNA users, Cisco Systems, Inc. last week rolled out an enhanced management package for SNA internetworks.

CiscoWorks Blue Native Service Point (NSP) Version 2 gives users greater visibility and control over the router- and SNA-based portions of their enterprise from a single mainframe-based IBM NetView or Sterling Software, Inc. Net/Master console.

NSP is but part of an overall Cisco effort to battle IBM for corporate backbone supremacy.

"The idea is to give SNA users full manageability of the Cisco routed network that they had with NetView and their SNA nets," said Rob Adams, product manager for network management solutions at Cisco's InterWorks business unit.

NSP is but part of an overall Cisco effort to battle IBM for corporate backbone supremacy. The company's mainframe channel-attached router — the Channel Interface Processor (CIP), which supports SNA and multiprotocol connectivity to the mainframe — is the main weapon in this battle.

And analysts said NSP is the type of ancillary product Cisco needs to be successful in the SNA marketplace.

"This release continues Cisco's trend of providing the ability to manage both legacy and newer internetworking resources without boundaries," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

NSP runs as either a NetView or Net/Master application and feeds Cisco router management data such as configuration, status and performance details to the NetView or Net/Master console. NSP code is required in each router to send data to the console. From there, a central operator can issue commands down to a router or SNA device.

The new version of NSP adds a variety of functions, such as the ability to track and monitor SNA Downstream Physical Units (DSPU) and get a better handle on the traffic flowing through the CIP, Adams said.

DSPUs are clusters of SNA devices communicating over a single line to a mainframe. NSP could not interact with those devices in the past. In the CIP, Adams said NSP can provide more detailed data on traffic flow than it could previously.

NSP's mainframe component will cost $9,995. The router will support NSP in IOS Version 11.0 at no extra charge.

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Scripting standard coming

Language will be similar to JavaScript and JScript.

By Carol Sliwa
Mountain View, Calif.

JavaScript. JScript. The names of those scripting languages should be distant memories by the middle of next year if a standardization effort proceeds according to plan.

Netscape Communications Corp. last month got the ball rolling when it turned over JavaScript to the Switzerland-based stan- dards group, ECMA, formerly the European Computer Manufacturers Association.

More than a dozen companies subsequently convened here at Netscape headquarters on Nov. 21 and 22 to lay the groundwork for a cross-platform, vendor-neutral scripting language they hope to complete by the time taxes are due on April 15, 1997.

ECMA's Secretary General Jan van den Beld, who led the two-day meeting, said he expects the new standardized scripting language will incorporate all the proposals and be backward-compatible with the existing implementations.

"There was a decision to go for a standard that does not violate the current, many thousand, uses of JavaScript and JScript," van den Beld said.

Scripting languages, which generally are not as complex as full-fledged programming languages, can be used to customize applications and, in the case of the Internet, tie together HTML, Java applets and plug-ins on a Web page.

The ECMA technical committee elected to give the proposed scripting language standard a new name. For now, it has been dubbed "ECMAscript," but plans call for a new name to be adopted within a month.

Editors already have scoped out the structure of the new standard and will prepare a draft for the next formal meeting, scheduled for Jan. 14.

Civil proceeding

Despite the competitive nature of the companies at the table, the proceedings were quite civil, by all accounts.

Netscape submitted its JavaScript specification for consideration, and then politely watched as arch rival Microsoft Corp. and Borland International, Inc., each made a case that their implementations should be the standard.

"I think everyone expected some fighting, and there really wasn't any," said Brent Noorda, president of Medford, Mass.-based Nombas, Inc., which also submitted a document describing its old Cmm scripting language (now called ScriptEase).

Bitter beginning

For months, Microsoft has complained bitterly that it was forced to develop its own version of JavaScript, which the company called JScript, because Netscape was so slow to turn over the specification that it had promised nearly a year ago.

"They made a commitment that they would do this, and people invested in JavaScript on the idea that [Netscape was] going to do what they said they were going to do," said Charles Fitzgerald, program manager for Microsoft's Internet platform and tools division.

On Dec. 4, 1995, Netscape announced plans to submit the draft specification of JavaScript to standards bodies — for review and comment — by the end of the month. Instead, Netscape found that it was far more difficult to write the specification than anticipated.

As Netscape worked on JavaScript, developers were left to choose between the different implementations.

"Since there wasn't really anything written down rock-solid, they've had to guess at what the script rules were, and every time a new browser comes out, you can't be sure your script is going to work in all the browsers," Noorda said. ■

ECMAscript standardization process

Mission: To develop a cross-platform, vendor-neutral scripting language based on initial submissions by Netscape (JavaScript), Microsoft (JScript) and Borland.

Participating companies include: Apple, Digital, HP, IBM, Mainsoft, NIST, Nombas, Silicon Graphics, Spyglass, Sun and Unisys

Chairman of technical committee: Gary Robinson of Sun

Vice chairmen: Carl Cargill of Netscape and Scott Wiltamuth of Microsoft

Next meeting: Jan. 14, 1997

Planned completion date: April 15, 1997

IBM preps 'Net server cluster

By John Robinson
Somers, N.Y.

IBM last week painted Internet all over its RS/6000 server line with a packaged hardware/software offering designed to power Web sites with transaction processing capabilities.

The IBM Cluster Internet PowerSolutions for AIX combine IBM's High Availability Clustered Multiprocessing (HACMP) software, two RS/6000 E30 servers and a selection of preinstalled Internet applications.

The server cluster can be configured with Netscape Communications Corp. Proxy Server 2.0 on one node and Netscape FastTrack Server 2.0 on the other; FastTrack Server on both nodes; or IBM Internet Connection Secure Server for AIX on both nodes.

The package includes AIX Version 4.2 and IBM's Cookbook guide to help customers install HACMP scripts and configure the cluster.

The system can be scaled up further, as HACMP software allows as many as eight RS/6000 servers to access the same data in a parallel configuration. The two-node PowerSolutions configuration provides basic failover capabilities, which IBM hopes will attract companies such as stock brokerages or mail-order catalogs looking to establish a reliable World-Wide Web presence.

IBM's E30 runs on a 133-MHz PowerPC chip and supports up to 960M bytes of ECC memory with 512K bytes of Level 2 cache. It also features eight expansion slots, and eight media and storage bays.

The IBM Cluster Internet PowerSolutions for AIX, available in January, are priced between $60,000 and $63,000, depending on configuration.

©IBM: (800) 426-2255.

E-mail firm reportedly shuts down

By Chris Nerney
Cambridge, Mass.

An early entrant into the free E-mail market was scheduled to shut down yesterday, sources said.

Freemark Communications, Inc. launched its advertiser-supported E-mail service last spring. Unlike E-mail programs that require an Internet connection, Freemark's product allowed users with a PC and modem to retrieve their messages by dialing an 800 number. Advertisements appeared on-screen along with the messages.

Freemark was the second company to offer ad-supported free E-mail. Its main competitor, heavily bankrolled Juno Online Services, L.P. in New York, released its product last April.

Officials of the Cambridge start-up were unavailable for comment. Freemark was founded in 1994 as ProductView Interactive.

A third company, HotMail Corp. in Sunnyvale, Calif., unveiled a Web-based free E-mail service in July. While also advertiser-supported, HotMail requires an Internet connection.

And USA.NET, a Colorado Springs start-up, today released NetAddress, another ad-supported E-mail service. ■

Electronic commerce

iCat software helps make the 'Best' of a Web situation

By Denise Pappalardo
Mountain View, Calif.

The holidays are coming, and ISP Best Internet Communications will make it easier to shop over the Internet — with a little help from a friend.

Best is bolstering its Business Commerce Server service by making it work with iCat Corp.'s Electronic Commerce Suite of software applications.

The iCat software will let Best Business Commerce Server service users add merchandise catalogues to their Web sites.

"Database software from iCat is offering users what other big companies like Oracle and Sybase aren't: good price points," analyst Chris Stevens said.

The iCat software suite includes two components: the iCat Commerce Publisher and the iCat Commerce Exchange. The Commerce Publisher client lets users develop the layout and content of their catalogue establishing the look and feel of the interactive site. Commerce Exchange supports transaction processing and keeps track of electronic orders and shopper registration in a database on the server.

"We have been looking for an application like this," said Rob Tobias, director of sales and marketing at Mixman Technologies, Inc., a San Francisco-based company.

Mixman develops and sells CD-ROM applications that let users remix music on their PC. Mixman's products are cataloged on their Web site using custom code, Tobias said.

"Our system works, but it doesn't work the best. Now that Best is offering an alternative, we will be looking into it," he said.

Best, based here, is a national Internet service provider that specializes in Web hosting services.

Best's Web host users can set up their purchase transactions using either Secure Sockets Layer or CyberCash, said Christina Kish, marketing communications manager at Best Tobias said his start-up company initially chose Best's Web hosting service because the company used CyberCash and offered competitive pricing.

"This is one more step in a logical progression that Best has been going through to offer customers what they want in Web hosting," said Chris Stevens, analyst at Aberdeen Group, Inc. "Database software [from iCat] is offering users what other big companies like Oracle and Sybase aren't: good price points," he said.

The Best/iCat package is available this month for an initial flat setup fee of $500. Users will then pay $395 to $995 per month, depending on the amount of disk space used.

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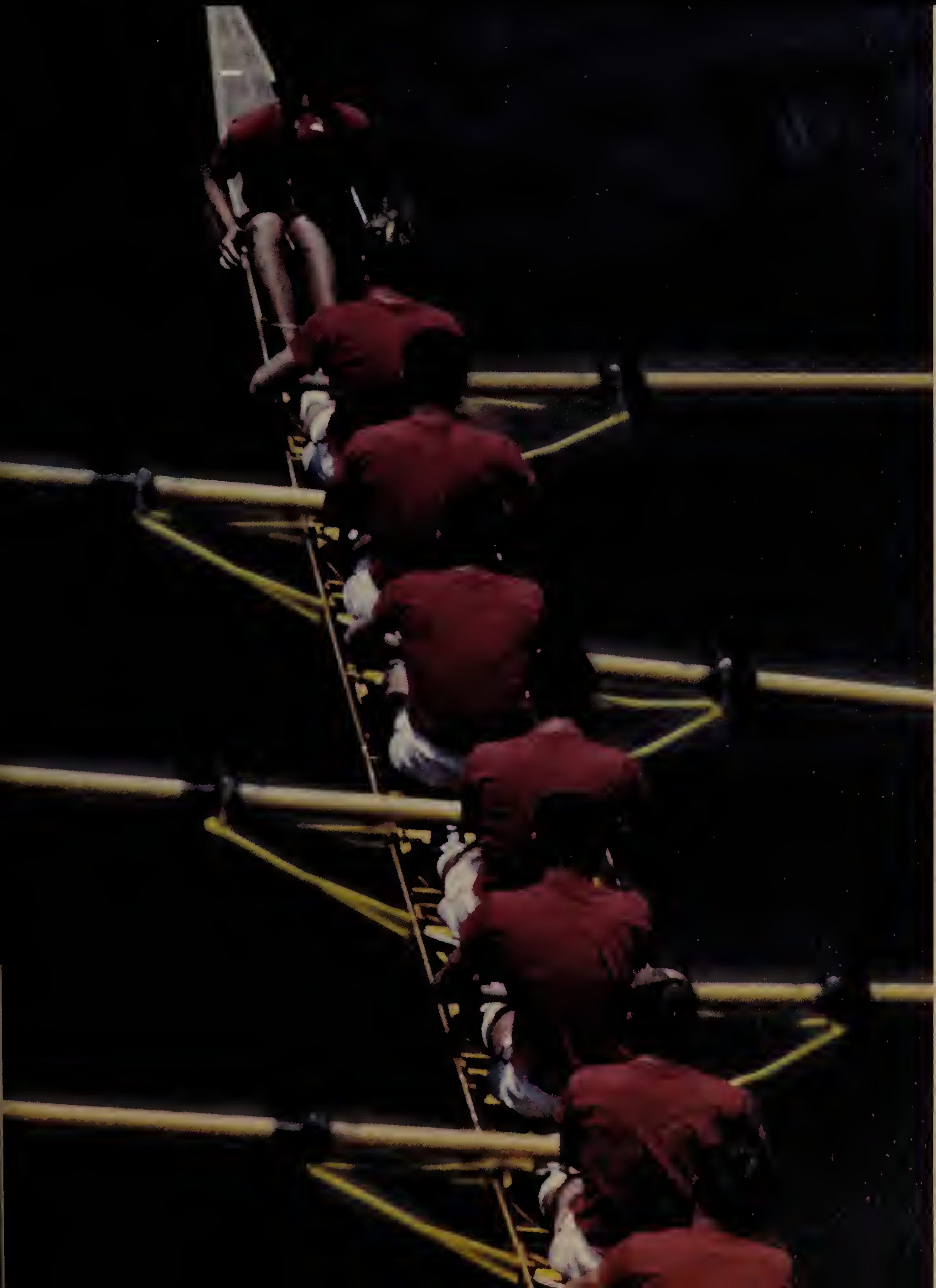

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Companies get jump on proposed backup spec

NetApp, PDC announce product support for NDMP.

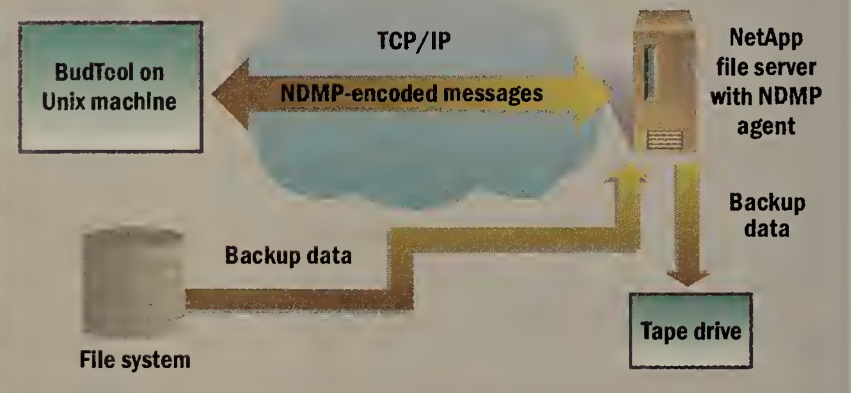
By John Robinson

Codevelopers of a proposed specification that allows different servers and backup software to interoperate are forging ahead with spec-based products, despite the fact that the Internet Engineering Task Force has yet to sign off on the proposal.

Network Appliance, Inc. (NetApp) and Peripheral Devices Corp. (PDC) this month are expected to announce support for each other's products under the Network Data Management Protocol (NDMP), introduced in October. The protocol, backed by 21 vendors, ensures interoperability between different file servers, storage devices and data management software.

NDMP MARRIAGE

Peripheral Devices' BudTool backup software sends encoded messages over the network to back up data from the file system to a tape drive connected to the NetApp file server.



NetApp is outfitting its family of dedicated file servers with an NDMP agent, and PDC is NDMP-enabling its BudTool Unix software to work with the NetApp machines (see graphic). While NetApp file servers ship with basic backup capabilities, the BudTool support will let administrators schedule, track and manage backup functions.

Rich Boberg, senior director of corporate strategy for NetApp, said if the specification changes over the course of the approval process, a software upgrade will be issued to customers. He added that the protocol should move quickly through the IETF approval process, and he expects more NDMP-enabled products from other vendors next year.

Five vendors recently added their support to the protocol: Orbit Group International, Dawn Technologies, Inc., Software Partners, Chewcoba Systems, Inc. and Network Storage Solutions, Inc.

A complete copy of the proposed specification can be downloaded from the NDMP Web site (www.ndmp.org.). The site also features an E-mail discussion group and a complete list of vendors backing the NDMP initiative.

©NetApp: (415) 428-5100; PDC: (800) 654-4732.

CORRECTIONS

In a recent story (Nov. 11, page 29), an incorrect phone number was given for MapInfo Corp. The correct number is (800) 327-8627.

In the Nov. 18 remote LAN access servers Buyer's Guide, we did not include TCP/IP as a protocol routed by LeeMah DataCom's BandWagon. In the same Buyer's Guide, we gave an incorrect sales phone number for Eversys Corp.'s CAPserver & System 8000. The correct number is (415) 897-8888.

Also, the following Short List products were not highlighted in the chart: Novell, Inc.'s NetWare Connect 2.0 and Shiva Corp.'s LanRover AccessSwitch. Cisco Systems, Inc.'s 2511 was incorrectly highlighted as a Short List product.

New carrier touts VPNs for financial firms

By Tim Greene
New York

IPC Information Systems, Inc., which makes desktop gear for financial traders, is widening its scope to offer international virtual private networks (VPN) to the same market.

The company recently announced it is selling the voice services over its own network to the world's major financial centers through a subsidiary called IXnet.

IXnet, which has no prior experience selling phone services, said it hopes to corner a lucrative specialty market while the major international carriers are preoccupied with battling one another.

The VPN service will include "Hoot 'n' Holler" connections, open-line connections among traders' desks across which they call out transactions.

With its knowledge of the desktop hardware and proprietary software, IXnet can offer specialized services that other carriers could not rival, said Terry Clontz, president of IPC. For example, it could offer a service to support one trader calling down to a particular speaker on another trader's desk.

The service would allow VPN calls to other financial houses that buy service from IXnet.

The traffic will run over a leased fiber backbone, controlled by IXnet's Northern Telecom, Inc. DMS-500 and DMS-100E switches.

Initial service offerings include VPN voice service, long-distance service and leased lines as fast as 2M bit/sec.

Within six months, the company will offer frame relay and ISDN as well as an Internet service designed for the financial community.

IXnet said it hopes AT&T will be too tied up figuring out how to handle merger Goliaths MCI Communications Corp./British Telecommunications plc and MFS Communications Company, Inc./ LDDS WorldCom to react to IXnet, Clonz said.

AT&T offers a global VPN service through its Uniworld venture but with the many separate carrier networks involved in Uniworld, it has taken awhile to debug (*NW*, Sept. 16, page 73).

Grabbing a narrow market is an idea others will seize upon as telecommunications markets open up, predicted Robert Rosenberg, president of Insight Research Corp., a Livingston, N.J., telecommunications market research firm.

With the regulatory environment allowing more players, related businesses will develop their own specialized network offerings tailored to their unique needs, he said.

He likened IXnet to the group of Florida health care organizations that plan to buy wholesale phone service through a local exchange carrier that one of their members set up (*NW*, Nov. 18, page 1). It is similar, too, to the consortium of 15 banks working with IBM to set up a secure banking intranet (*NW*, Sept. 16, page 73), he said.

©IXnet: (800) 982-2231.

NETWORK FOR TRADERS

IX's virtual private network for financial traders offers points of presence in eight cities, with plans for six more.

Existing points of presence
Planned expansion points of presence

Frame relay switches claim SVC edge

By Tim Greene
Germantown, Md.

Hughes Network Systems recently announced two frame relay edge switches that support switched virtual circuits (SVC) and frame relay service quality guarantees.

The IX200 and IX500 boxes are seen as a way for users with dedicated-line networks to economically and progressively upgrade to frame relay to realize the lower transport costs.

The switches have the capability to set up SVCs, which allow more flexibility in meshing the user's network and gives carriers more efficient use of their core switches.

The Hughes edge switches would bundle SVCs within permanent virtual circuits (PVC) set up through the existing carrier core switches. Those virtual paths would help avoid packet delays that can bedevil SNA and voice traffic.

Thomas Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J., said the switches are low cost and would complement existing T-1 data networks.

"It's nice for someone who doesn't have an appetite for next-generation applications, such as video and multimedia that require higher and more expensive bandwidths, but wants to better the quality of service," Nolle said.

Using Hughes' VPStreaming technology, the IX device would negotiate a virtual path through PVCs that those existing frame relay switches can set up.

The IX devices would record details of the SVC established, track the level of service provided, the bandwidth allocated and the amount of data sent. All of that information could be used by a service provider to bill in new ways for frame relay.

The SVC capability will be available in February. The PVC capability is available now.

The IX500 has a five-slot chassis, and the IX200 has a two-slot chassis. They support the same eight-port serial modules. The larger box is designed for a regional enterprise hub or carrier, while the smaller one is meant for smaller branch offices.

The IX switches will be available within 90 days with prices starting at $4,000.

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VPN

Continued from page 1

for large customers was 7.5 cents as recently as 12 to 18 months ago, Levine said. "Now, if your on/off minutes total $20 million a year and you're paying more than 5 cents, you're paying too much," he said. Even if your total commitment is $1 million a year, you should get an on/off rate below 7 cents, he added.

Customers can reduce their rates if they are in the middle of a term contract with a carrier, as well. GPU's Hafer is paying between 7.5 and 8 cents for SDN on/off connections in a deal expiring next year. But because of GPU's volume growth, AT&T has already offered to shave at least a penny a minute in an immediate new deal, and many rival carriers are looking to beat that offer.

WARNING

CREEPING MAC AHEAD

MAC is the minimum annual commitment users make to qualify for a low rate on carrier services.

Creeping MACs is the carriers' practice of writing into a multiyear contract that the MAC automatically increases each year.

Experts warn against creeping MACs because they make it harder for users to reopen negotiations to take advantage of falling rates – even if their volume grows every year.

Carrier officials confirmed that they are knocking on doors regardless of existing contract terms, and looking to lower customer costs. "We proactively work with our customers," said Ron McMurtry, MCI's director of strategic marketing.

In a reversal of the industry's historic pattern, McMurtry said MCI is responding to AT&T's "aggressive pursuit" of business in customer negotiations this year.

But McMurtry said customers cannot get a super low rate by negotiating for a new VPN contract in isolation. "If someone came up and said, 'We want 5 cents a minute just for voice service,' we would say, 'Absolutely not,' " McMurtry said. To get near that threshold, users must also give MCI a piece of their data services, he said.

Why the lower rates?

The trend to bundle VPN, 800 and data services on a single large-user contract got a big boost when AT&T added frame relay to its Tariff 12 deals earlier this year. This move is just one of a number of simultaneous factors leading to the likelihood that several years of long-distance price hikes on business services are coming to an end.

For example, the Federal Communications Commission's decision last month to abolish tariffs is freeing carriers and users from tying their long-term contracts to artificial list prices.

And by next May, the FCC is obligated to reform the system under which local carriers charge an average of 3 cents per minute on switched access termination. The switched access charge is expected to go down, and savvy users signing long-term deals are telling carriers that they should factor what are likely to be lower access expenses into contract rates for 1997 and 1998.

But new voice-over-data options are the real kicker, observers said. Officials with one enterprise switch vendor told *Network World* they are presenting customers with a study that says the fully loaded cost of making a voice call over a private ATM net is 0.5 cents per minute.

And many customers are letting their carriers know it is an option, carrier officials concede.

"They are very concerned about that," said the telecommunications manager at a New York investment banking company who asked not to be named. "I don't think they should be, but you bet I'm taking advantage of [the perception]."

"A lot of our customers are asking about voice over frame, voice over ATM

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and voice over the Internet," said an LDDS WorldCom spokeswoman.

The company has even dialed back its plans to launch its first-ever VPN in recognition of the trend — and in expectation that its pending merger with MFS Communications Company, Inc. will give it potential leadership in voice-over-data solutions.

To get the best deal in today's environment, customers must avoid certain traps in the process.

Many companies make the mistake, even when signing a relatively modest three-year term contract, of agreeing in advance to an increasing minimum annual commitment (MAC) to the carrier in each of those three years.

The problem with such "creeping MACs" is that the carrier has a lock on the volume growth you expect over those three years, and will have no incentive to renegotiate the deal as rates drop.

"One of the five largest banks in the country is still at 7.5 cents for on/off traffic, but that's because they committed 110% of their traffic [to one carrier]," Levine said. "They should have done 70% and kept a quarter of their traffic in play."

Hafer added that as next May approaches and long-distance carriers become more aware of how much money they will save under the FCC's new access rules, the VPN offers will continue to come down.

"The numbers will get even better," agreed the New York financial telecom manager. "The game is still afoot."

"You don't buy long in a falling market," Levine said. ■

AT&T takes a hike

AT&T uncorked a Thanksgiving Day surprise for unwary network managers in the form of a 4.8% price increase on switched business services, including the Software Defined Network, all 800 services and many other offerings.

For customers on existing term contracts tied to regular tariffs, the effect of AT&T's move is to increase their costs until they have a chance to renegotiate their deals — or bid out new traffic they generate beyond their existing volume commitments to AT&T.

An AT&T spokesman said the price hike is needed to pay for the carrier's ongoing investment in network infrastructure.

"For those [customers] unwilling to take the time to do comparison shopping and renegotiate or stabilize their rates, this is terrible," said Washington, D.C. user attorney Ellen Block. "The carrier's costs are not rising at that rate."

The Federal Communications Commission has ordered the abolition of tariffs by mid-1997. But until then, AT&T and other carriers have the right to raise rates in the middle of a user's contract through a tariff filing.

AT&T officials quietly filed the price increase last Wednesday at the FCC to take effect the next day — Thanksgiving Day. The increase affects all switched services except one that is designed for small businesses. Private lines and packet data services such as frame relay are not affected in this latest action.

Customers of AT&T's Tariff 12 service also will escape the price increase because special language in Tariff 12 exempts them from such rate hikes. But most other AT&T term contracts are tied to the underlying tariff rate, so now is an especially good time to seek new carrier contracts, Block said. Not only is there a bidding war for new deals (see story, page 1), but those new deals can also fall under the FCC's de-tariffing rule.

—David Rohde

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Denver, CO	Sep. 12
Des Moines, IA	Sep. 27
Detroit, MI	Dec. 5
Edmonton, Alb., Can.	Dec. 5
Houston, TX	Oct. 21
Indianapolis, IN	Sep. 9
Irvine, CA	Nov. 6
Jackson, MS	Oct. 15
Jacksonville, FL	Sep. 30
Jersey City, NJ	Nov. 13
Kansas City, MO	Oct. 1
Knoxville, TN	Oct. 11
Lexington, KY	Oct. 9
Little Rock, AR	Sep. 23
Los Angeles, CA	Nov. 8
Louisville, KY	Oct. 7
Memphis, TN	Sep. 25
Miami, FL	Oct. 4
Milwaukee, WI	Sep. 13
Minneapolis/St. Paul, MN	Sep. 16
Montgomery, AL	Oct. 9
Nashville, TN	Sep. 27
Norfolk, VA	Oct. 29
Oklahoma City, OK	Sep. 18
Omaha, NE	Sep. 25
Parsippany, NJ	Nov. 15
Philadelphia, PA	Nov. 11
Phoenix, AZ	Nov. 1
Pittsburgh, PA	Dec. 12
Portland, OR	Aug. 9
Raleigh/Durham, NC	Oct. 25
Richmond, VA	Oct. 31
Rochester, NY	Nov. 21
Sacramento, CA	Nov. 13
Salt Lake City, UT	Sep. 9
San Antonio, TX	Oct. 25
San Diego, CA	Nov. 4
San Francisco, CA	Nov. 15
San Jose, CA	Nov. 18
St. Louis, MO	Oct. 3
Tampa, FL	Oct. 2
Tucson, AZ	Oct. 30
Tulsa, OK	Sep. 20
Washington DC	Nov. 8
Wichita, KS	Sep. 16
Winnipeg, Man., Can.	Sep. 20
Winston-Salem, NC	Oct. 23

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*__________

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:
1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*__________

3 What is the estimated value of networking equipment and services that you help specify, recommend or approve? (check one only)

01. ☐ $100 million or more
02. ☐ $50 mil. - $99.9 mil.
03. ☐ $25 mil. - $49.9 mil.
04. ☐ $20 mil. - $24.9 mil.
05. ☐ $10 mil. - $19.9 mil.
06. ☐ $5 mil. - $9.9 mil.
07. ☐ $1 mil. - $4.9 mil.
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $100,000 - $249,999
11. ☐ None of the above

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

5 Are you involved in the purchase of and/or plan to purchase network products and services?

☐ Yes ☐ No

6 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

LOCAL-AREA NETWORKS
A B
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ Network Op. Sys. Software
☐ 03. ☐ LAN Storage/Backup
☐ 04. ☐ Optical LAN Storage/Backup
☐ 05. ☐ Disk LAN Storage/Backup
☐ 06. ☐ Tape LAN Storage/Backup
☐ 07. ☐ RAID LAN Storage/Backup
☐ 08. ☐ Network Test/Diagnostic Tools
☐ 09. ☐ Cables, Connectors, Baluns
☐ 10. ☐ UPS
☐ 11. ☐ Network Interface Cards
☐ 12. ☐ Peer-to-Peer LANs
☐ 13. ☐ SNMP Network Management
☐ 14. ☐ ATM Switches
☐ 15. ☐ Token-Ring Switches
☐ 16. ☐ Ethernet Switches
☐ 17. ☐ Remote LAN Access/Communications Servers
☐ 18. ☐ Superservers
☐ 19. ☐ File/Application Servers
☐ 20. ☐ Print Servers/Fax Servers
☐ 21. ☐ CD-ROM Servers
☐ 22. ☐ LAN Servers

INTERNETWORKING
A B
☐ 23. ☐ Bridges
☐ 24. ☐ Routers
☐ 25. ☐ Bridge/Router
☐ 26. ☐ Gateways
☐ 27. ☐ Intelligent Hubs
☐ 28. ☐ Stackable Hubs

COMPUTERS/PERIPHERALS
A B
☐ 29. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 30. ☐ Micros/PCs
☐ 31. ☐ Minis
☐ 32. ☐ Mainframes
☐ 33. ☐ Workstations
☐ 34. ☐ Terminals
☐ 35. ☐ Printers/Network Printers
☐ 36. ☐ Cluster Controllers
☐ 37. ☐ CD-ROM
☐ 38. ☐ Fax/Modem Boards

REMOTE/WIRELESS COMPUTING
A B
☐ 39. ☐ PDAs
☐ 40. ☐ PCMCIA Devices
☐ 41. ☐ Wireless Data Services
☐ 42. ☐ Wireless Data Equipment
☐ 43. ☐ Wireless LANs
☐ 44. ☐ Cellular Equipment & Services

INTERNET/INTRANET
A B
☐ 45. ☐ Internet Access Service
☐ 46. ☐ Firewalls/Security
☐ 47. ☐ Web Servers

INTERNET/INTRANET (cont'd)
A B
☐ 48. ☐ Web Browsers
☐ 49. ☐ Intranet Applications/Groupware
☐ 50. ☐ Search Retrieval Products (web crawler)
☐ 51. ☐ Internet Development Tools
☐ 52. ☐ Internet Commerce Tools

SOFTWARE/APPLICATIONS
A B
☐ 53. ☐ Network Management
☐ 54. ☐ Systems Management
☐ 55. ☐ Security
☐ 56. ☐ Communications Software
☐ 57. ☐ Terminal Emulation
☐ 58. ☐ Word Processing
☐ 59. ☐ Operating Systems
☐ 60. ☐ Client/Server Applications Development
☐ 61. ☐ Database Management/RDBMS
☐ 62. ☐ Spreadsheet
☐ 63. ☐ Groupware
☐ 64. ☐ EDI
☐ 65. ☐ E-mail
☐ 66. ☐ Windows/Graphical User Interface
☐ 67. ☐ Multimedia
☐ 68. ☐ Graphics/DTP
☐ 69. ☐ Remote Access
☐ 70. ☐ Imaging
☐ 71. ☐ Server Suites (Back office, etc.)
☐ 72. ☐ Suites
☐ 73. ☐ Middleware
☐ 74. ☐ Document Management
☐ 75. ☐ Database Server
☐ 76. ☐ Site Metering Tools
☐ 77. ☐ Computer-Integrated Telephony (CIT)

WIDE-AREA NETWORK EQUIPMENT & SERVICES
A B
☐ 78. ☐ Frame Relay Equip./Services
☐ 79. ☐ Modems
☐ 80. ☐ FT-1/T-1/T-3 Multiplexers
☐ 81. ☐ FT-1/T-1/T-3 Services
☐ 82. ☐ SONET
☐ 83. ☐ Inverse Multiplexers
☐ 84. ☐ SMDS
☐ 85. ☐ Asynchronous Transfer Mode
☐ 86. ☐ Diagnostic/Test Equipment
☐ 87. ☐ DSU/CSU
☐ 88. ☐ VSAT/Satellite
☐ 89. ☐ ISDN Equipment & Services
☐ 90. ☐ PBXs
☐ 91. ☐ Voice Mail/Response
☐ 92. ☐ Videoconferencing
☐ 93. ☐ Leased Lines
☐ 94. ☐ Switched Data
☐ 95. ☐ E-mail
☐ 96. ☐ 800/900/MTS Services
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 107 ☐ None of the above (1-99)

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

NETWORK PROTOCOLS
A B
☐ 01. ☐ SNA
☐ 02. ☐ DECnet
☐ 03. ☐ TCP/IP
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ APPC/APPN/LU 6.2
☐ 06. ☐ NETBIOS
☐ 07. ☐ AppleTalk
☐ 08. ☐ NFS
☐ 09. ☐ IPv6
☐ 10. ☐ SNMP/SNMPv2
☐ 11. ☐ Other *(please specify)*__________

NETWORK OPERATING SYSTEM
A B
☐ 12. ☐ Microsoft (LAN Manager)
☐ 13. ☐ Novell (NetWare 2.X, 3.X)
☐ 14. ☐ Novell (NetWare 4.X)
☐ 15. ☐ Windows NT
☐ 16. ☐ Windows NT/Advanced Server
☐ 17. ☐ LocalTalk (AppleTalk)
☐ 18. ☐ Banyan (VINES)
☐ 19. ☐ IBM (LAN Server)
☐ 20. ☐ IBM (PC LAN Program)
☐ 21. ☐ Artisoft (LANtastic)
☐ 22. ☐ Digital (Pathworks)
☐ 23. ☐ Other *(please specify)*__________

LAN ENVIRONMENT
A B
☐ 24. ☐ 4M Token Ring
☐ 25. ☐ 16M Token Ring
☐ 26. ☐ Ethernet
☐ 27. ☐ Fast Ethernet
☐ 28. ☐ 100vg Any LAN
☐ 29. ☐ FDDI
☐ 30. ☐ LocalTalk
☐ 31. ☐ 10Base-T
☐ 32. ☐ ATM
☐ 33. ☐ Other *(please specify)*__________

COMPUTER OPERATING SYSTEM
A B
☐ 34. ☐ DOS
☐ 35. ☐ Unix/Xenix/AIX
☐ 36. ☐ OS/2
☐ 37. ☐ OS/2 Warp
☐ 38. ☐ IBM MVS
☐ 39. ☐ IBM VM
☐ 40. ☐ Digital VMS
☐ 41. ☐ Macintosh
☐ 42. ☐ Windows
☐ 43. ☐ Windows 95
☐ 44. ☐ NT
☐ 45. ☐ Solaris
☐ 46. ☐ Other *(please specify)*__________

☐ 47. ☐ None of the above (1-46)

8 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE
(check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

9 What is the total number of LANs, workstations/nodes at this location/in your organization?

At this location:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

Entire organization:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

10 Please indicate your involvement in developing/implementing Internet/Intranet Technologies: (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ Implement
6. ☐ None

11 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

Mainframes	A – Installed	B – Planned
1. IBM	☐	☐
2. Amdahl	☐	☐
3. Cray	☐	☐
4. Hitachi	☐	☐
5. Unisys	☐	☐

Minis	C – Installed	D – Planned
1. IBM	☐	☐
2. Digital	☐	☐
3. Tandem	☐	☐
4. Unisys	☐	☐
5. AT&T GIS	☐	☐
6. HP	☐	☐
7. Data General	☐	☐

What is the total number of Servers/Clients installed/planned: (USE NUMBERS ONLY)

E-AT THIS LOCATION	#	F-% with Internet Access
1. Servers		%
2. Clients		%

G-ENTIRE ORGANIZATION	#	H-% with Internet Access
1. Servers		%
2. Clients		%

Which of the following Servers/Clients do you have Installed/planned: (CHECK ALL THAT APPLY)

	At this location:		Entire organization:	
	I-Servers	J-Clients	K-Servers	L-Clients
01. Power PC	☐	☐	☐	☐
02. Power Mac	☐	☐	☐	☐
03. Mac Other	☐	☐	☐	☐
04. Multi Processor Servers	☐	☐	☐	☐
05. P6	☐	☐	☐	☐
06. Pentium Pro	☐	☐	☐	☐
07. Pentium	☐	☐	☐	☐
08. 486	☐	☐	☐	☐
09. 386	☐	☐	☐	☐
10. 286	☐	☐	☐	☐
11. Risc	☐	☐	☐	☐
12. Other	☐	☐	☐	☐

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 billion to $9.9 billion
3. ☐ $500 million to $999.9 million
4. ☐ $100 million to $499.9 million
5. ☐ $50 million to $99.9 million
6. ☐ $10 million to $49.9 million
7. ☐ $5 million to $9.9 million
8. ☐ $4.9 million or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

Entire organization:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

14 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

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Briefs

Gensym Corp. *has announced FaultExpert, software said to provide* **intelligent fault management** *of distributed networks. FaultExpert detects and filters events from network devices, operating systems and applications. FaultExpert correlates and analyzes faults, advises operators of probable root causes and initiates automated corrective actions.*

FaultExpert will be available in the first half of 1997 on HP-UX, Sun Solaris, IBM AIX and Windows NT platforms. Pricing was not disclosed.

Gensym: (617) 547-2500.

Engage Communications *is now shipping its Advanced ExpressRouter with three integrated T-1/fractional T-1 DSUs/CSUs. The Advanced ExpressRouter is a* **multiprotocol Ethernet branch office/Internet access router** *that supports up to three E-1 WAN links. The Advanced ExpressRouter routes IP, IPX and AppleTalk protocols.*

With a single integrated WAN link, the Advanced ExpressRouter costs $1,995. Each additional WAN interface costs $1,000.

Engage: (408) 688-1021.

Farallon Communications, Inc. *this week will introduce two new* **ISDN routers** *that let small remote offices tie as many as 12 users to the Internet with a single-user Internet account. Called Smart IP, the feature lets users avoid more expensive LAN Internet accounts. Physically, the new routers add two analog ports to the existing 630 router that support caller ID and distinctive ringing. The 435 supports AppleTalk, but the 635 does not. The 435 costs $1,375, while the 635 costs $849. They'll be available later this month.*

Farallon: (510) 814-5020.

HP fortifies management tools

Company boasts net and systems management offering with support for Web, Windows NT.

By Jim Duffy
Palo Alto, Calif.

Hewlett-Packard Co. has enhanced a couple of its network and systems management offerings by adding support for two wildly popular technologies: the World-Wide Web and Windows NT.

On the network management front, HP last week added Web-based network monitoring tools to its NetMetrix network analysis product line.

For systems management, HP has added enterprise data backup and restoral capabilities for Windows NT networks to its OmniBack II application.

To make it easier for users to view internetwork response time and node availability data, HP has integrated its Internetwork Response Manager application with NetMetrix Reporter, a Web-based reporting tool. This information can now be accessed from any Web browser or on the HP OpenView Network Node Manager platform.

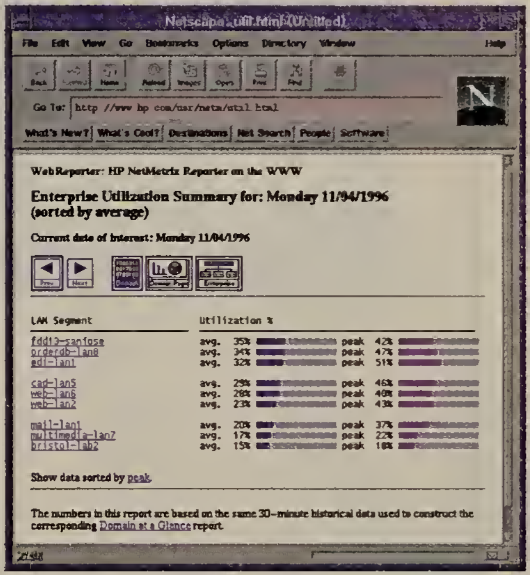
Users said the Web will relieve them from juggling multiple, and somewhat expensive interfaces for viewing LAN metrics.

"We've got 200 to 250 probes on different segments all over the world," said David Fleig, telecommunications analyst at Eli Lilly and Co. in Indianapolis. "I've gotten tired of managing a bunch of HP-UX boxes and X terminals for people to get at the information."

HP has also enhanced its NetMetrix tools by adding the ability to measure global network performance via the Web. This enables users to view parameters across the enterprise rather than one segment at a time. HP has also added exception reporting to NetMetrix, which eliminates the need for users to sift through hundreds of graphs and metrics to reach the desired information, HP claimed.

Fleig said there is still room for improvement here, though.

"You still don't get the summarizations we're interested in without further customization," he said. Eli Lilly would like to be able to parse network metric information so network technicians see only what they need to see, and applications programmers only see what's pertinent to them, he said.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WebReporter: HP NetMetrix Reporter on the WWW

Enterprise Utilization Summary for: Monday 11/04/1996
(sorted by average)

Current date of interest: Monday 11/04/1996

LAN Segment	Utilization %			
fddi3-sanjose	avg.	35%	peak	42%
orderdb-lan8	avg.	34%	peak	47%
edi-lan1	avg.	32%	peak	51%
cad-lan5	avg.	29%	peak	46%
web-lan6	avg.	28%	peak	40%
web-lan2	avg.	23%	peak	43%
mail-lan1	avg.	20%	peak	37%
multimedia-lan7	avg.	17%	peak	22%
bristol-lab2	avg.	15%	peak	18%

Show data sorted by peak.

The numbers in this report are based on the same 30-minute historical data used to construct the corresponding Domain at a Glance report.

HP's *Web interface for its NetMetrix network analysis products will make it easier to view segment utilization.*

The NetMetrix tools are avail-

See **HP**, *page 18*

Computer-telephone integration

Lucent lets NT dial up PBX

By David Rohde
Basking Ridge, N.J.

Lucent Technologies, Inc. kept its promise to broaden its computer-telephone integration (CTI) strategy beyond strict reliance on Novell, Inc. NetWare LANs by shipping its PassageWay Telephony Services for Microsoft Corp.'s Windows NT Server.

This new software is loaded on an NT server and allows it to exchange commands with a Lucent Definity G3 PBX.

As a result, individual employees can send telephony commands from their client PCs, through the NT server, and across to the PBX that controls the telephone — all without a physical connection between the devices on the desktop.

The original 1994 version of PassageWay Telephony Services provided PBX connectivity only with NetWare 3.X and 4.X servers (see graphic).

A separate PassageWay product provides desktop connectivity between individual telephones and desktop PCs running Windows 3.1.

But that implementation requires software to be loaded on every client PC, and requires a physical connection between the phone and PC, limiting the appeal to enterprise network managers.

GETTING DIVERSIFIED

Lucent's PassageWay Telephony Services now supports a variety of server and client platforms:

Servers *	Clients
Windows NT 3.51	Windows 3.X
NetWare 3.X and 4.X	Windows 95
	Windows NT
	OS/2
	Macintosh
	UnixWare
	HP-UX

* The server must be connected to a Lucent Definity G3 PBX.

Customers lead the way

Lucent made the move to follow the Windows NT migration of its customers, including those in corporate call centers where CTI is popular, according to Bill Riley, Lucent's managing director for CTI.

Lucent is willing to license the new server software to other PBX manufacturers, Riley said. But those competitors would still have to write their own PBX drivers to communicate with the new NT telephony software. Such PBX drivers took as long as two years to complete after Novell and Lucent predecessor AT&T announced the original Net-

See **Lucent**, *page 18*

Bay enhances providers' services

By Jim Duffy
Billerica, Mass.

Bay Networks, Inc. last week rolled out an offering designed to help service providers manage end-user networks.

OptivityServices is intended to provide integrated network management capabilities for service providers that are delivering managed services to customer premises. It is also designed to manage the service provider's network access infrastructure.

OptivityServices includes Bay's Optivity Enterprise software — an element management application for large networks, partnerships with third-party software vendors and customization services provided by Bay technicians.

Analysts say Bay's traditional competitors — Cabletron Systems, Inc., Cisco Systems, Inc. and 3Com Corp. — offer only pieces of OptivityServices.

"The closest vendor of anybody — and there's a few major holes there — would be Cabletron and Spectrum," said John Morency, principal at The Registry, Inc., a Newton, Mass.-based consultancy. Cisco comes closest with its recently acquired NetSys network modeling product line, he said.

Components of OptivityServices

- Optivity Enterprise
- Third-party applications for
  - Service provisioning
  - Network simulation
  - Data collection
  - Network planning and analysis
  - Billing
- Customization services

To date, Bay has lined up Syndesis, Ltd., MIL 3, Inc., Desktalk Systems, Inc., WANDL, Inc. and Anite Systems to provide applications for OptivityServices. These companies develop service provisioning, network simulation, data collection, network planning and analysis, and billing

See **Bay**, *page 18*

Lucent

Continued from page 17

Ware Telephony Services.

PassageWay Telephony Services for Windows NT has been tested in half a dozen call center environments, Riley said. Like previous CTI implementations, the new product is still expected to be first sold to administrators of call centers and help desks.

But Riley said Lucent is also seeing some interest among users for corporate directory applications. In those applications, employees are provided continually updated internal employee directories on their PC screens.

They can then dial anyone by clicking on the correct entry.

Prices for the NT version of PassageWay are identical to the NetWare version. Following a price reduction earlier this year, PassageWay for NetWare now sells for between $24 and $108 per seat, depending on such factors as the size of the Definity switch.

©Lucent: (888) 458-2368.

HP

Continued from page 17

able now and priced between $3,995 and $20,995.

HP's OpenView OmniBack II for Windows NT is also said to provide enterprise-level capabilities. The new software provides backup and restoral management from a central location or from distributed management stations, HP said.

OmniBack II for Windows NT is integrated with Microsoft Corp.'s BackOffice application suite, enabling users to perform online backup for SQL Server and Exchange Server data, HP said. OmniBack II also provides real-time backup for SAP R/3 data.

HP's OmniBack II for Windows NT is said to provide enterprise-level capabilities.

HP also said OmniBack II backup reports can be generated on the Web.

In addition to providing backup and restoral for homogeneous Windows NT environments, OmniBack II can also provide these capabilities for heterogeneous NT, NetWare and Unix environments, HP said.

OmniBack II for Windows NT is available now with a starting price of $3,800.

©HP: (800) 752-0900.

Bay

Continued from page 17

applications, respectively.

Bay has added new APIs to Optivity Enterprise for these applications to work with it.

Optivity Enterprise, meanwhile, is installed by the services provider within the customer premises for end users to monitor the delivery of managed services. Optivity Enterprise is also installed within the service provider's point of presence to manage Bay's equipment. Such gear includes the 5000 Multi-Service Switch, Backbone Node and Access Node routers, BayStream multiservice software, Remote Annex servers and LANcity cable modems.

Optivity Enterprise runs on Hewlett-Packard Co.'s OpenView, IBM's NetView for AIX and SunSoft, Inc.'s Solstice SunNet Manager.

For customization services, Bay offers software installation and implementation, customized reports, polling policies, integration of non-Bay management information, automated data collection and fault-based application launching. Bay also provides central site backup services, called ServiceLink, to cover the service provider network at off-hours or for management outsourcing.

OptivityServices is available now, and is priced between $7,000 and $80,000 for Optivity Enterprise and the third-party applications. Customization services are priced based on requirements.

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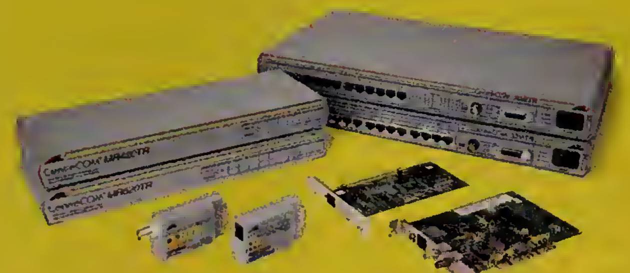

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AT-MR820TR	8-port workgroup hub	$129.95
AT-MR420TR	4-port workgroup hub	$109.95
AT-3012TR	12-port workgroup hub	$229.95
AT-3016TR	16-port workgroup hub	$259.95
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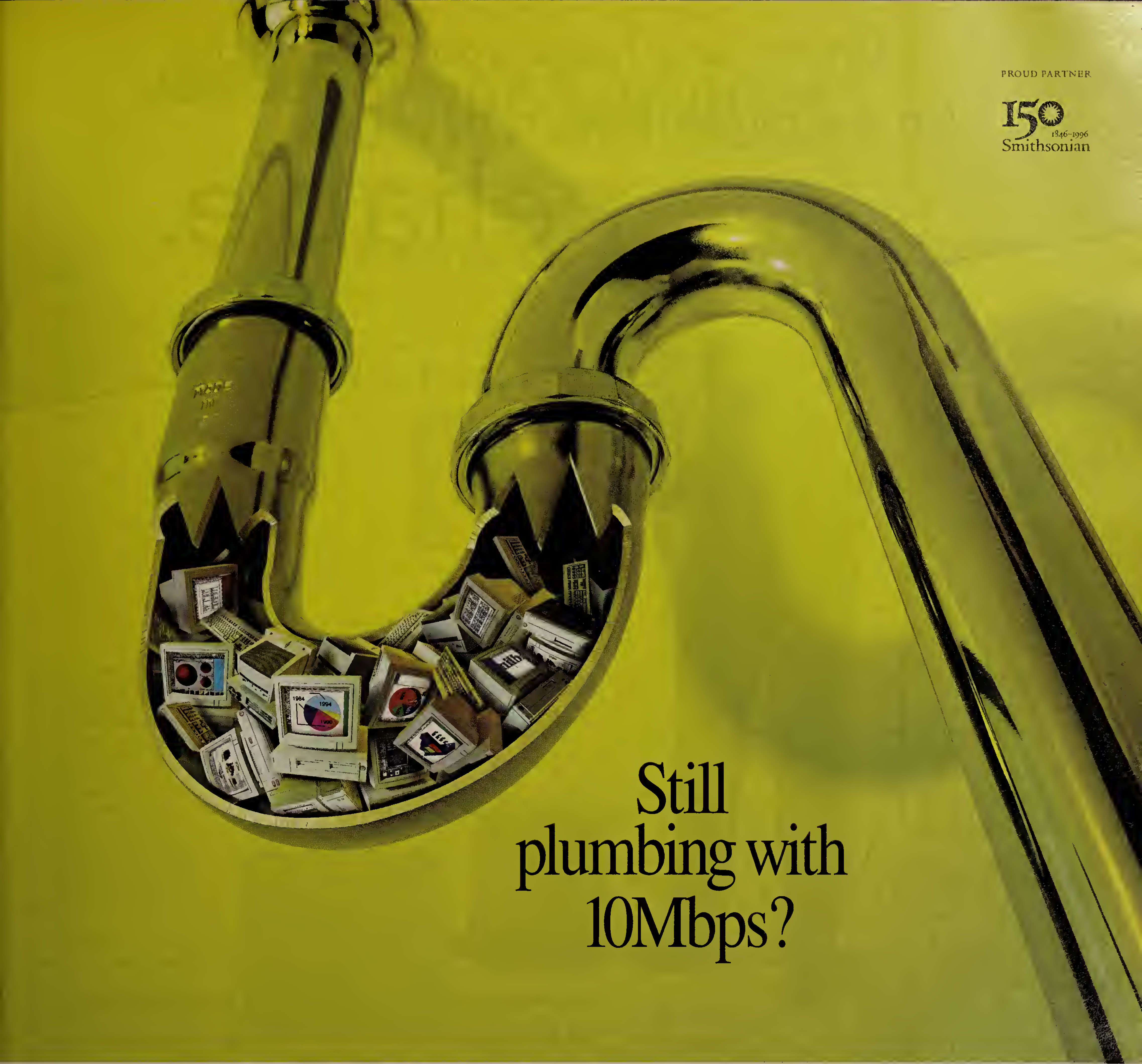

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Covering: Local and Long-Distance Services • Value-Added Networks • Cable, Satellite and Wireless Networks • Regulatory Affairs • Carrier-Based Internet Services

Briefs

■ **Ameritech Corp.** *recently teamed up with IMC, Ltd. of Great Falls, Va., to offer* **call center consulting,** *a move aimed at getting the carrier's feet wet in the business. When Ameritech gets approval to offer full long-distance services, that consulting business could blossom because it will be able to provide full, nationwide 800-number service for call centers. Teaming with IMC gives an initial offering that includes hardware, telephone network services, training, staffing, and traffic analysis and forecasting.*

■ *A little chocolate binging could be excused at* **MCI Communications Corp.** *as the carrier has won a* **$34 million contract with Nestle USA, Inc.** *Unlike many carrier contracts with users, MCI's deal with Nestle includes the company's entire domestic voice and data communications network. Included are MCI's Vnet intracompany calling plan and HyperStream frame relay service, plus private lines, 800 service, audioconferencing, videoconferencing and network management.*

■ *Jack Fields (R-Texas), retiring House of Representatives telecommunications subcommittee chairman, blasted* **Federal Communications Commission** *Chairman Reed Hundt for specifying the prices at which local carriers must offer pieces of their nets to new competitors — a function that Fields claimed Congress left to the states.*

Fields said **Hundt should "read Shakespeare and understand that discretion is the better part of valor.** *If he won't read Shakespeare, I hope that he will read Section 251 and Section 252 of the Act." These sections of the new telecom law deal with local interconnection.*

Fields said Hundt's interpretation could have been a "simple and honest mistake," but if it wasn't, "he should resign, or the president should appoint someone else who can read."

AT&T official pushes public-net solutions

Gail McGovern speaks out on frame relay migration, local competition and the Internet.

As executive vice president of business markets for AT&T, Gail McGovern is a champion for AT&T's ongoing transformation from a pure transport provider into a vendor of enterprise network solutions. At the recent Communications Managers Association convention in New York, McGovern sat down with *Network World* Senior Washington Correspondent David Rohde to discuss current issues.

PHOTOS BY STEVE BORNS

AT&T recently increased prices for private lines, coupled with a frame relay price decrease. Are you now genuinely happy to see all of your SNA customers migrate to the lower priced service?

We didn't make the price changes because we were trying to incent migration; we made the price changes because we felt that they were reflective of the marketplace.

Download the full transcript of our interview with AT&T's Gail McGovern.

Enter the number above in the DocFinder box on the home page.

http://www.nwfusion.com

If there's another large wave of frame relay users, including SNA users, are you prepared to keep the installation intervals going at 30 to 45 days, and if so, how?

We are constantly monitoring those intervals, and there are times when they get elongated — often when a very, very large customer comes through the door and has a huge installation. And there are times when they're shorter.

The way that we handle the demand is somewhat labor-intensive.

So we change the size of the workforce to handle the peaks and the valleys.

A large number of people are now using AT&T for Internet access, but people don't tend to think of AT&T as a major carrier of the Internet backbone. They think of MCI and Sprint. Does that bother you?

Where we think we're really uniquely positioned here is we've got an enormous relationship with the 800 merchants.

We're getting more Internet access customers, and what we think we can do is kind of marry those two bases — and we've got the credit card operation, so we have a way to do the credit card authorization. So we think we have a great set of core competencies that can really get businesses to start transacting business on the 'Net.

What do you see as the future of intracompany calling plans such as AT&T's Software Defined Network? A lot of vendors say, 'We can skim the cream right off the top by installing ATM switches, and company employees can call each other for free rather than for 10 cents a minute.'

I'm hearing those discussions, too. There's definitely a technological wave toward ATM. But it's going to take awhile because all of our devices and modems — and everything else that's out there — is circuit-switched technology.

I also think eventually people will be completing calls using packet telephony using the Internet services. In fact, our Immediate Answers [Internet call center integration] service is really what customers want — a total blending of voice and data applications. But it'll take awhile.

Now that AT&T has spun off Lucent Technologies, can we expect to see partnership arrangements or announcements from AT&T with other customer premises equipment companies, particularly the big internetworking companies?

We ask customers over time what they want to bundle together. And they will cite things like wireless, local, credit card and long-distance services way before they'll say, 'oh, and can you throw in my PBX?'

Outside our office building, marked right on the street, is the site where MCI is laying fiber. Can you give users a rationale for waiting for AT&T to be up and running with local service through resale, given the court stay of federal interconnection rules vs. somebody building a facility and maybe having it ready soon?

There are a whole lot of different ways that AT&T can provide local service. One is through resale. And as long as customers are connected directly to our network, that's another way we can provide local service. I don't think it's required to get into every single city and start laying fiber because overcapacity isn't going to help the industry or our customers.

We also have relationships with seven competitive access providers in 79 cities. ■

Baby bells sell shared software arm

By Tim Greene

San Diego

Local telephone competition apparently means at least one thing: It is no longer OK to share.

With this in mind, the regional Bell operating companies recently sold off Bellcore, their shared software-development and systems integration subsidiary.

A surprising suitor, Science Applications International Corp. (SAIC), which also owns Internet domain registration firm Network Solutions, Inc., put down an unconfirmed $700 million for Bellcore. The sale is expected to go through sometime next year.

Unloading Bellcore became inevitable after telecommunications reform redefined the RBOCs as rivals rather than discrete regional service providers.

"Each of us is pursuing our own competitive strategies and markets. While our needs for Bellcore continue, those needs are unique to each company rather than common," said Marty Kaplan, president of Pacific Bell's Network Services Group.

The RBOCs still represent 75% to 80% of Bellcore's business. Bellcore President George Heilmeir said he expected the RBOCs to remain Bellcore's dominant customers for the foreseeable future.

WHO BOUGHT BELLCORE?

Company: Science Applications International
Based: San Diego
Founded: 1969
1995 revenue: $2.2 billion
Main business: Network integration and consulting for national security, environment, energy, health care, transportation, telecommunications and space
Owner: Its 22,000 employees

SAIC specializes in consulting on systems integration for military, telecommunications and health care applications, among others. It has also developed security for 'Net infrastructures.

After the sale, Bellcore will remain intact as an SAIC unit and try to continue expanding its customer base, according to Heilmeir. ■

WAN MONITOR

SVC applications and availability

We are currently in the process of writing a white paper about switched virtual circuits (SVC) for frame relay and ATM, and thought we'd share some of this information with you. The most commonly asked questions concern the uses and benefits of SVCs compared to permanent virtual circuits (PVC).

The biggest benefits of SVCs are in net management and accounting, and any-to-any connectivity. Unlike their PVC brethren, SVCs do not require network operators to establish and maintain predefined logical connections between sites. Even a modestly sized network can result in hundreds of PVCs to support partial mesh connectivity. The tendency is that many companies fall back on a star configuration to save money and reduce complexity. Yet routing all that traffic through a central location hurts net performance.

SVCs will make remote site interconnectivity a reality. They will also be useful for supporting highly intermittent applications such as conference or voice calls, overflow traffic during busy hours or connections from the enterprise network into the Internet. SVCs may be the only practical way to support interenterprise connectivity. However, if SVCs are priced on a usage basis, you may still want PVCs between those locations where traffic density is high. This is strictly an economic issue: PVCs may be more cost-effective.

A side benefit is that SVCs will let network operators gather detailed statistics on the usage of the net. This data can be very useful for sizing access or backbone links in the network and would allow network managers to bill back network usage to different departments or workstations.

To alleviate security concerns, public SVC offerings will have to include the ability for end-user equipment to accept the call from the requesting device before establishing the connection. As services mature, many of the advanced feature offerings of voice-based virtual private networks, including closed user groups, account code screening and billing flexibility, will be added to frame and ATM SVC offerings.

Daniel Briere and Christine Heckart

Specs defined by the ATM Forum to support interoperability with existing LANs and internetworking protocols such as IP depend heavily on SVCs. LAN Emulation and Multi-Protocol over ATM specs will not work without SVCs.

When will SVCs be available? There are a few central office equipment vendors supporting SVCs. Customer premises equipment support is still lacking but is expected to mature in 1997. A few of the larger service providers are eyeing SVCs and may offer the capability in 1997. But, 1997 will be a year of experimentation.

What can you do? You can let your carrier know if you need SVCs, and work interactively with carriers and vendors to get the bugs out in early trials so general availability can be accelerated.

If you are interested in SVCs, we would like to hear from you. Please drop us an E-mail message and tell us your application and whether you need SVCs over frame relay or ATM or both.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@ telechoice.com.

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*Circle Reader Service #*25

Local Networks

Covering: Servers • Operating systems • LAN management
Hubs • Switches • Adapters and other equipment

Briefs

■ **Hewlett-Packard Co.** *is shipping a network printer that combines the functionality of an office* **printer and copier** *in*

one product. HP's LaserJet 5Si Mopier eliminates trips from the printer to the copier through HP's new Transmit Once technology, which allows the Mopier to receive print/copy data once and store it on an internal disk drive.

The product reduces net traffic created by generating multiple printouts of a single document. The Mopier ships with drivers for Windows 3.1, 95 and NT, as well as IBM OS/2 and Macintosh environments. The LaserJet 5Si Mopier is priced at $9,549.

HP: (800) 752-0900.

■ **Novell, Inc.** *added to its fault-tolerant IntranetWare arsenal by licensing* **Vinca Corp.'s StandbyServer** *failover software. Novell will position the product as a low-end counterpart to its more costly SFT III fault-tolerant offering.*

StandbyServer is designed to supply fault tolerance for single-processor or symmetric multiprocessing servers running NetWare 3.X or 4.X and third-party NLMs that are not certified for SFT III. It mirrors only data to the standby server, and provides automatic recovery from both hardware and software failures. StandbyServer is sold with an unlimited user license for $3,499.

Novell: (800) 638-9273; Vinca: (800) 934-9530.

Gabbing about Gigabit networks

Gigabit Ethernet Alliance's Tony Lee shares his views on the hot new LAN technology.

The Gigabit Ethernet industry is catching fire — and there aren't even any products out yet. The first major conference on the technology was held last month, more than 20 Gigabit Ethernet start-ups are said to be in the works, and the Gigabit Ethernet Alliance is nearing 100 members. Tony Lee, chairman of the alliance as well as a Sun Microsystems, Inc. senior product manager of networking, recently gave *Network World* Senior Writer Jodi Cohen the lowdown on where the market for this emerging high-speed technology stands.

What are the biggest obstacles for widespread acceptance of Gigabit Ethernet?

We have to be careful to manage the hype. Whenever there is a product that is not yet out on the market and the technology isn't delivering any real value to the end user, that's probably when everything sounds good. So we need to make sure that when the products appear that they conform to IEEE specifications.

From the alliance perspective, we must demonstrate in-teroperability to make end users comfortable that this technology will fit into their existing Ethernet and Fast Ethernet environment. There is going to be quite a bit of risk in bringing out product before the standard is set, but we'll just have to make sure that all the end users understand that the risk can be managed.

Are you worried that Gigabit Ethernet has received too much attention early on?

Not really. What we have been able to do is present the time line to everybody for how the standard is progressing. We are always updating end users as to where things are so that they can set realistic expectations. Of course, it's hard to control a lot of excited vendors out there.

How well equipped are operating systems to take advantage of high-speed technology such as Gigabit Ethernet?

Some operating systems may be better than others in helping you to realize the networking capabilities. That really depends on what the end user's requirements are.

For example, if you look at using Gigabit Ethernet in high-performance file servers, Windows NT and Solaris will probably be the best operating systems to take advantage of the technology.

STEVE BORNS

The alliance claims that one of the biggest advantages of Gigabit Ethernet is that it's not really new technology, but rather an extension to good ol' Ethernet. Is that fair considering it's based on Fibre Channel and there's some talk about extending frame sizes?

It's all relative. Compared to other emerging high-speed technologies, this is evolutionary. It's an upgrade technology vs. a replacement technology. It maintains a lot of the Ethernet characteristics where we also leverage other pieces from other technologies where it makes sense.

First there was Ethernet, then Fast Ethernet, and now we're talking about Gigabit Ethernet. Will it keep going up?

There is really no technical feasibility problem in terms of scaling to, say, 10G bit/sec. But at this point, it's too early to talk about that. In terms of the silicon technology, Texas Instruments just announced the .18 chip. Once it starts shipping in volume by 1998 or 1999, we could conceivably look into the 10G bit/sec alternative. Of course, at that point — if the CPU continues to be enhanced in the pattern that we are seeing today — we probably will need 10G bit/sec sometime down the road.

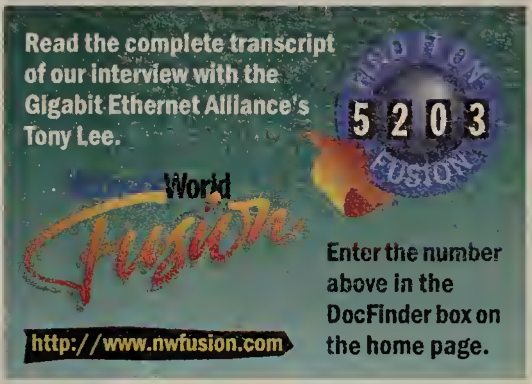
What effect will one of Sun's favorite topics — Java — have on Gigabit Ethernet?

Java computing will require you to ship the applications over the network regardless of the connection. That connection could be Ethernet, Fast Ethernet, token ring or FDDI, and, in the backbone, either Gigabit Ethernet or ATM. So the more people start using Java and network computers, the more bandwidth you will be required to have on the network. The more successful Java becomes, the more demand there will be for high-speed technologies like Gigabit Ethernet.

Also, Java devices do not have to be computers. They could be a hand-held device or set-top box. So that would maybe require certain quality-of-service. Then the customer can decide if it makes ense to have Gigabit Ethernet with RSVP or to go with ATM.

What's Sun doing in the way of Gigabit Ethernet products?

We are participating heavily in the standards process. We're also looking at how a technology can help us get better connectivity to our servers and desktops. ■



Read the complete transcript of our interview with the Gigabit Ethernet Alliance's Tony Lee.

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Vendors show off speedier I/O

By Christine Burns
Las Vegas

Some two dozen vendors used Comdex/Fall '96 to demonstrate the performance and manageability advantages of supporting I2O, an increasingly popular specification for improving the way servers handle I/O.

Announced in January, the I2O architecture makes it possible for servers to off-load device drivers to intelligent I/O processors, speeding up overall server I/O. Additionally, this frees up the main processor to handle high-bandwidth applications such as networked video, groupware and Web transactions.

"This architecture frees up the main CPU to handle what an advanced CPU is designed to handle — the applications, not the read/write operations," said Scott Goble, intelligent I/O software manager with Intel Corp. Goble is also the president of the I2O Special Interest Group, a collection of 75 vendors driving this standard.

The architecture separates the portion of the driver responsible for managing the device from the part that communicates with the server operating system. This allows hardware vendors to write a single I2O-compliant driver that works with any operating system that supports the specification.

With I2O-compliant hardware and software, administrators will find it easier to configure and maintain device drivers across operating systems, and they can expect their hardware to yield higher throughput.

Operating system vendors ready with prototype software —referred to as I2O Operating System Modules — were Microsoft Corp., Novell, Inc. and The Santa Cruz Operation, Inc. Systems, motherboard and network card companies such as Adaptec, Inc., 3Com Corp. and Xpoint Technologies, Inc. provided varying levels of platform support. ■

WIRED WINDOWS

Now I've got my Comdex horror story

Almost everyone who goes to Comdex has a horror story to tell. Now I finally have mine.

I hadn't planned to attend this fall's show, but some opportunities popped up two weeks before the show that appeared to make the trip worthwhile.

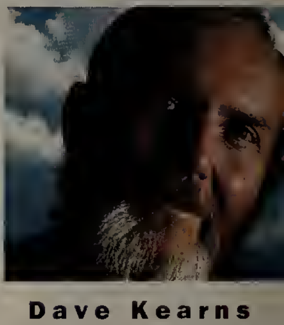
I've used online services to book almost all of my plane reservations for years, primarily American Airlines, Inc.'s Eaasy Sabre on CompuServe, and this seemed like a good opportunity to put Microsoft Corp.'s new Expedia online travel service to the test.

So on Monday Nov. 4, I pointed my Web browser to http://expedia.msn.com/. After a bit of searching, I found flights I liked — from both a cost and time standpoint (America West, $142 round-trip). So I purchased the ticket, received confirmation online and had E-mail confirmation within two hours.

Imagine my surprise when I went back to the Expedia site Tuesday to find a hotel and found a message telling me that the flight would cost $156. A quick call to Expedia confirmed the price change, but no reason was given except that "sometimes the computers are slow."

When I received the tickets, though, it became more evident. Although I'd "purchased" the ticket on Nov. 4, the itinerary given to me showed the purchase date as Nov. 5. The $142 was a 14-day advanced purchase fare, unavailable 13 days before the flight.

On top of this, I had to find a hotel just two weeks before the show. Not surprisingly, I was met with a constant refrain of "No rooms, sorry." But, through Expedia, I finally did find one hotel with rooms — the Carriage House. Although the rate was higher than I wanted to pay, I reserved a room for three nights and paid a one-night deposit. I was a bit surprised, however, when I arrived at the hotel and found there was no reservation — and no rooms available.


Dave Kearns

I showed my confirmation number and mentioned the one-night deposit I'd paid. But the confirmation number didn't resemble the hotel's, and the rate was higher than what the hotel charges.

At this point, we got on the phone to Expedia, and I left the hotel manager to straighten it out. After 20 minutes, the manager came back to me and explained that although Expedia had made the error, the hotel would find me a room (a very nice suite and no casino).

Tip of the week

Here's one more bookmark for network information on the Web. Try out http://www.inquiry.com/ to find lots of information about network concepts and products in a vendor-neutral environment. It's also a place to ask questions and get answers.

Once settled in, I called Expedia to find out their version of the slip-up. What I found was that the Hotel Tverskaya in Moscow, Russia, was eagerly awaiting my arrival.

The moral of the story, sadly, is that you still need to use the telephone to verify that the hotel knows you're coming. It's also one more black eye for Microsoft's attempts at online commerce.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

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"Frame relay has quickly become the foundation for many corporate WANs, offering significant cost savings and flexibility. But building and managing a frame relay network requires new skills and expertise."
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Implementing Frame Relay: Strategies and Solutions will help you decide whether frame relay is the right service for your company, and you will learn what benefits you can expect from implementing a frame relay network. In addition, this seminar, taught by Tom Jenkins of TeleChoice, Inc., a frame relay expert, will explore which applications perform well on a frame relay network and which carriers you need to consider in your evaluation process.

Even if you have already implemented a frame relay network, attending this information-packed one-day seminar will teach you the new features and services available in the market and how they can benefit your company.

Whether you are a network/telecom planner, manager, designer or administrator, **Implementing Frame Relay: Strategies and Solutions** will provide you with the information and insight necessary to more efficiently and effectively implement and manage your network.

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2. Learn when frame relay is a more economical solution than other service options
3. Understand the limitations and benefits of using NNIs
4. Discover which frame relay service features are significant and which are merely hype
5. Gain an understanding of the direction of the frame relay market
6. Analyze the differences between major U.S. frame relay providers
7. Learn how to save money by consolidating your voice and data applications over frame relay
8. Understand the alternative approaches to running SNA applications over frame relay
9. Learn how pricing structures differ among carriers and how you can take advantage of these differences to obtain the best service bargain
10. Analyze case studies of various network types to see how frame relay can be best implemented
11. Learn about new and likely future service enhancements which could impact your network
12. Examine your existing carrier and services features to see if they are best suited for your current and future network requirements

1997 LOCATIONS AND DATES

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Irvine, CA	Mar. 4	Dallas, TX	Apr. 2
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Client/Server Applications

Covering: Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

Briefs

Borland International, Inc. *last week announced the appointment of* **Delbert Yocam,** *a one-time senior executive at Apple Computer, Inc., as its new chief executive officer and chairman of the board.*

Yocam will be charged with returning the software development tool maker to profitability, starting with overseeing the promotion of three products due for release over the next six months, officials said.

Yocam's predecessor, Gary Wetsel, resigned in July in anticipation of the company reporting poor first-quarter earnings. Since then, two other top executives, David Mullen and Paul Gross, have left the company.

Data Junction Corp. (formerly Tools & Techniques, Inc.) *of Austin, Texas, last week released Data Junction for Windows 5.11, a graphical* **tool set for converting data** *from one format to another. The new release supports Open Database Connectivity-compliant databases and adds utilities for direct database connections and data loading.*

The vendor added support for nearly 30 new data formats, including Lotus Notes, HTML exports, several native SQL database formats and a range of desktop applications.

Data Junction: (512) 459-1308.

Forte Software, Inc. *of Oakland, Calif., recently announced plans for Release 3.0 of its Forte tool set for building distributed enterprise applications. Due out by mid-1997, the release will support Microsoft Corp.* **ActiveX,** *include a new tool kit built in conjunction with Conextions, Inc. to let developers access legacy data as native Forte objects, and let C++ modules call Forte application servers.*

Pricing is $4,000 to $6,000 per developer.

Forte: (510) 869-3400.

Radnet reaches for share of groupware market

By Chris Nerney
Cambridge, Mass.

As a key senior executive at Lotus Development Corp., Don Bulens helped build a network of more than 13,000 resellers that develop and market applications based on Notes.

Now, as the president and chief executive officer of start-up Radnet, Inc., Bulens' mission is to cut into Notes' enviable slice of the groupware market.

What gives Radnet an edge over Lotus and other competitors, he said, is a powerful weapon: the World-Wide Web. Radnet's groupware product, WebShare, is "the only completely Web-based groupware application platform," making it ideal for corporate intranets, Bulens said.

"WebShare can integrate and interact with any system's infrastructure. It is accessible from any Web browser used for the Internet or in an intranet."

First released in June, WebShare consists of the WebShare Server ($2,195), which stores information about applications and manages the presentation of documents to the end user, and the WebShare Designer ($995), an application development tool. WebShare Designer includes templates for eight customizable groupware applications, including calendaring, discussion threads and employee records.

RADNET

Headquarters: Cambridge, Mass.
Founded: 1995
Product: WebShare, a Web-based groupware program
Revenue: $7.5 million (projected)
Competitors: Lotus, NetManage, Thuridion
Web address: www.radnet.com

WebShare 1.2, an updated version supporting Microsoft Corp.'s BackOffice and Netscape Communications Corp.'s SuiteSpot, was released last month. WebShare runs on Windows NT and employs the Sybase, Inc. SQL Anywhere database engine and a Spyglass, Inc. Mosaic-based browser.

Web-based groupware is an idea that "has wide appeal," said David Strom, who runs a consultancy based in Port Washington, N.Y. "People are comfortable with their Web browsers."

Jeanne Lambert, a longtime Notes user and recent WebShare customer, agreed.

Radnet *CEO Don Bulens says the company's Web-based groupware platform can work with "any system's infrastructure."*

"Notes is very proprietary," said Lambert, president and chief executive officer of Telesales, Inc., a consulting and high-tech outsourcing services company in Wilmington, Mass. "But Web technology is well known to everybody."

Bulens said that while it was too early to announce revenue from WebShare, he expects Radnet to "be a $7.5 million business next year."

For now, though, Radnet faces competition from other groupware start-ups as well as Lotus, which last month filed a lawsuit alleging that Bulens illegally recruited a Lotus sales executive. According to Bulens, the suit "is without grounds." ■

Developers dipping toes into Java waters

By Elinor Mills
Las Vegas

Developers with an eye on the Internet and intranet market thronged around booths exhibiting Java technology at last month's Comdex/Fall '96 show looking for ways to create software that will make life easier for corporate end users.

Comdex Java sampler

Company	Announcement
Corel (613) 728-8200	Previewed Corel Office for Java, an office suite including word processing, database and other tools.
Finjan Software (216) 932-9775	Introduced SurfinGate, software to help corporations protect against attacks that can be carried out through Java applets downloaded from the Internet.
Paralogic (510) 795-0559	Rolled out Java-based chat software that allows Web site developers to set up a chat room by inserting about five lines of HTML code on a Web page.

One entrepreneur said he wants to develop applications that will allow users to access quick technical support and software updates, such as upgrades and device drivers, from vendors directly through the Internet, as well as enable live transactions.

"These are the two biggest issues for customers," said David Sinclair, director of PC General, a retail store in Christchurch, New Zealand, who plans to start an Internet software firm. "I want to be able to reduce support because now support costs are too high."

Another attendee said he wants to use Java to create voice recognition applications that would allow employees at an electricity company to use both hands to work with equipment while using speech to gather information and perform other tasks through another computer.

"The technology may be several years away," however, said Craig Marian, systems analyst at Southern California Edison (SCE) in Huntington Beach. The SCE system currently uses OS/2.

One developer said he was limited by Java when trying to create accounting applications and adding image rendering to game programs. "When I first used Java, some capabilities were missing, such as database connectivity," said Alfonso Montilla, analyst and programmer at Data Processing Field Engineering in Los Angeles. "They provide that with ActiveX controls."

So far, most Java applets are used for simple tasks such as animating Web pages, said Roger Bowman, developer relations manager for Symantec Corp., in a conference session. "They have also not proved to be very robust," he said, adding there needs to be more basic class libraries for Java.

"It would be nice to use something like Java simply because it's not from Microsoft," said Raimo Oinas, technical manager at Espoo, Finland-based Software Point, a maker of information management software for laboratories. "It's the principle of it."

Software Point is currently using C++ and Delphi, and experimenting with Java, which Oinas said "is so new that the standard is not ready yet. Maybe after a couple of years it will be worthwhile."

Java applets and applications "will completely dominate at some point," but not just Java applications that simply mirror regular applications, said Miko Matsumura, Java evangelist at Sun Microsystems, Inc., during a conference session. The Java applications will have special network-related functions such as shared files and Web publishing.

But a director of marketing for Visual Basic in Microsoft's Internet Platform and Tools Division said Java has a way to go. "The day where you can run mission-critical data, such as financial applications, off a network in Java is at least three years away," predicted Jon Roskill during the conference session.

Mills is a correspondent in IDG News Service's Boston bureau. News Service correspondents Rob Guth and Kristi Essick contributed to this story.

SHARED LOGIC

Beam me up, Computer Associates

Computer Associates International, Inc. is readying the next major release of its Unicenter systems management product, cleverly dubbed TNG (The Next Generation), for general availability by year-end. The tool, as you may have guessed, is designed to manage The Enterprise.

The question is, does TNG boldly go where no enterprise management product has gone before?

I recently made the trek to Islandia, N.Y., to see for myself, and spoke with CA's top gun in program management, Yogesh Gupta.

In summary, I would say that, yes, TNG is a revolutionary product. In particular, CA's Real World three-dimensional user interface is light-years ahead of its competition.

Warp Factor 10 graphics do not come at a small price, however. The demonstration I watched was running on a dual-Pentium Intergraph machine with gobs of memory and a graphics accelerator. While the graphics were truly stunning, there didn't seem to be much power left to run the less dramatic componentry, such as dialog boxes and lists.

I was particularly curious about how TNG would handle the complex task of application management, particularly for complex client/server systems such as data warehousing and online transaction processing. For starters, TNG is adept at monitoring applications that are already part of the Unicenter family, such as the ACF2 security tool.

But how can such a management tool possibly know the constraints of a customer-defined application? For example, suppose your development staff has just put a new application onto the network and you want TNG to monitor the application and notify you of any showstopping errors.

Marc Myers

This is quite achievable with the upcoming product, though it necessitates mastering the CA Agent Factory software developers' kit. The Agent Factory gives customers the ability to construct a network component that watches and reports on customer-defined applications.

According to CA, constructing an agent requires about one workday from an experienced programmer. And customers are biting. Gupta told me that one of CA's beta sites, American International Group, has written more than 50 agents to automate its application management environment.

Customers can also opt for canned agents, which are ready for consumption today for applications from Informix Software, Inc., Oracle Corp., Sybase, Inc. and others.

While you may fall in love with TNG immediately because of its great user interface, pricing is out of this world. Rather than provide a price, CA counts how many "power units" you want to deploy. Each PC or server configured for TNG receives a power unit rating. CA determines the total number of units you need to purchase and charges you for each one.

Of course, Unicenter TNG is a rangy product that goes far beyond application management to include software distribution, network management and advanced help desk functionality. I have only scratched the surface here.

Myers is chief executive officer of Client/Server Connection, Ltd., a New York-based software development company. He can be reached via the Internet at mmyers@cscl.com.

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11/6/96	Chicago, IL	11/7/96
12/2/96	Washington, DC	12/3/96
12/5/96	Atlanta, GA	12/6/96
12/10/96	San Francisco, CA	12/11/96
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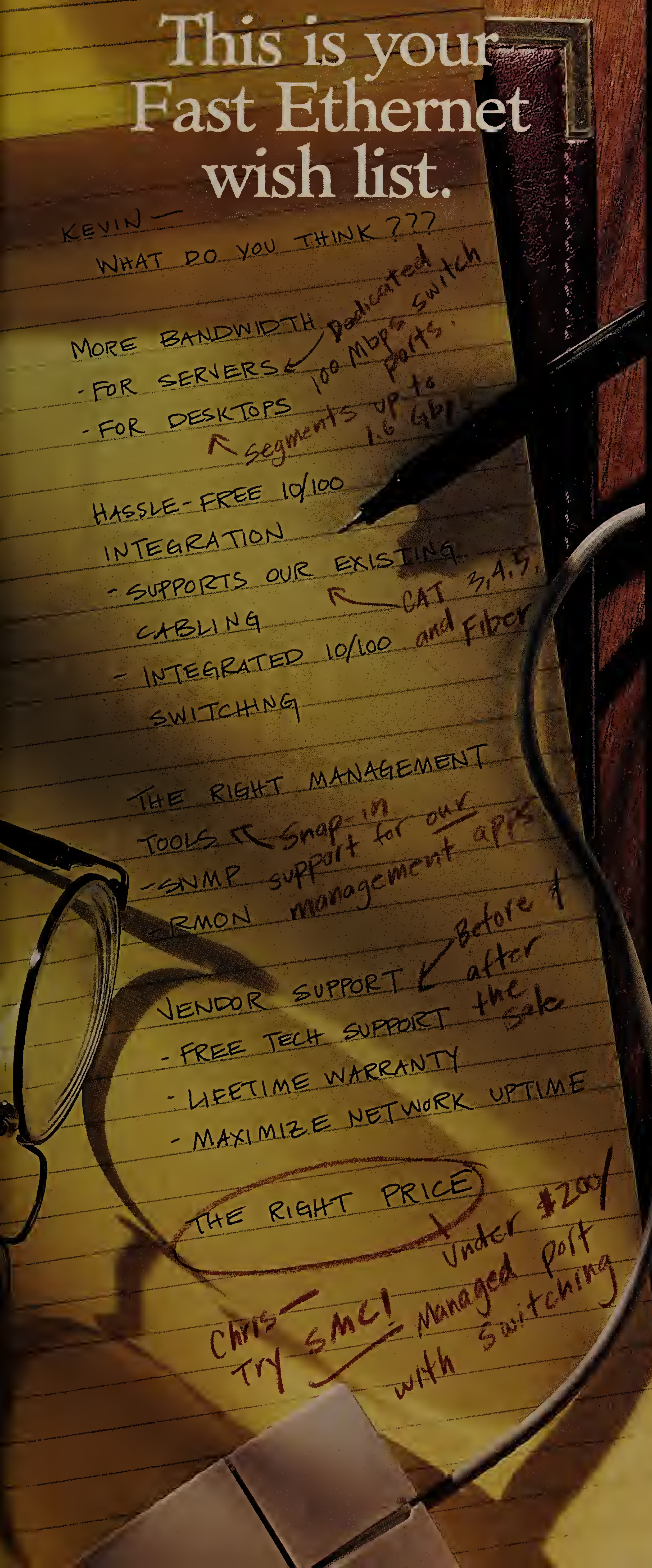

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Circle Reader Service **#36**

Object databases driving new generation of applications

Relational database vendors scramble to add object support to their traditional offerings.

By John Cox

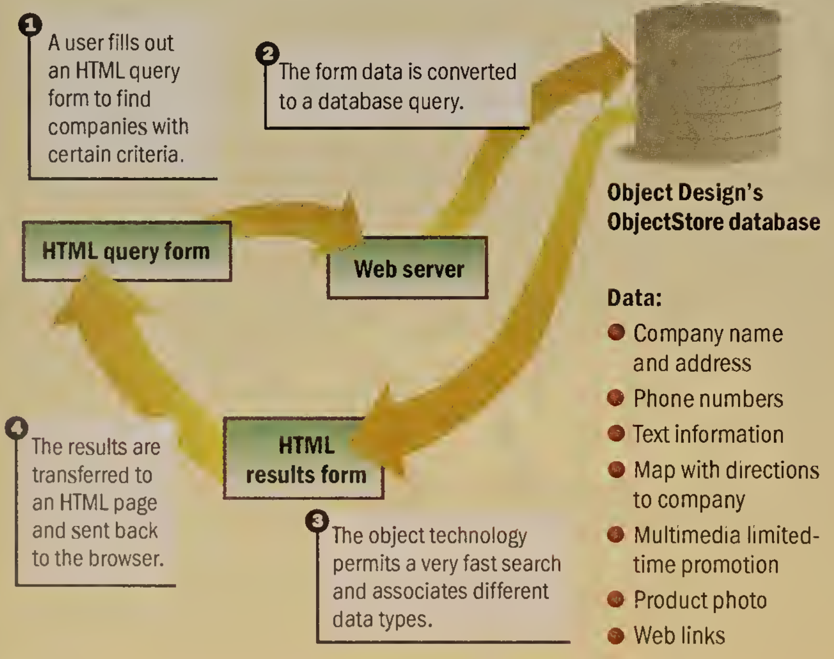
To create and manage complex Web applications, MIS groups are turning to object-oriented databases. As a result, database vendors are scrambling to satisfy a surging demand for new features and capabilities.

Object databases, by definition, efficiently store, manage and access the complex data types that are the essence of Web applications: documents, images, audio and video. And they manage the even more complex interrelationships among these types, such as the maze of hyperlinks that interconnect HTML documents.

The current generation of relational database management systems are ill-suited to handle complex, hierarchical relationships and different data types. That is starting to change, though.

GTE SUPERPAGES

By using an object database, GTE is able to make 11 million business listings – in a variety of data formats – searchable from a Web browser.


1 A user fills out an HTML query form to find companies with certain criteria.
2 The form data is converted to a database query.
HTML query form
Web server
Object Design's ObjectStore database
HTML results form
3 The object technology permits a very fast search and associates different data types.
4 The results are transferred to an HTML page and sent back to the browser.
Data:
Company name and address
Phone numbers
Text information
Map with directions to company
Multimedia limited-time promotion
Product photo
Web links

IBM already has multimedia "extenders" for DB2. It will announce this week DB2 Universal Database, which boasts object capabilities and is scheduled to ship around mid-1997. Separately, Informix Software, Inc. this week will unveil availability of its Informix Universal Server, while Oracle Corp. will release a database with object extensions sometime in 1997.

Object databases and connectivity software — most from a collection of lower profile vendors — have been handling such complexity for years.

"The bulk of the object database products are about 7- to 9-years-old," said Joshua Duhl, principal consultant at Stillpoint Consulting in Cambridge, Mass.

"You have reasonably robust technology, with the [connectivity and transaction support] features and capabilities people expect in traditional database technology," he said.

"With complicated systems, modeling the workflow and creating rules and descriptions of the problem [you're trying to solve] is hard to do with a relational database," said Eric Magleby, vice president of marketing, Alta Software, Inc., a Reston, Va., distributed object consulting company. "We found that using an object database is really less of a risk than using relational technology [for such applications]."

ObjectStore assembles data and text — and soon images and multimedia — into HTML pages that are forwarded to the client browsers.

In addition to handling a range of data types, object databases handle such data quickly, Duhl said.

"In working with complex data models, object databases can be 10 to 100 times faster than relational databases," he said. Relational databases have to complete numerous time-consuming and resource-intensive table joins to process such models.

Object databases at work

Object databases can be used in a variety of ways with Web applications.

GTE SuperPages, an online business yellow pages, is a Web site that uses an object database as the heart of its application (see graphic).

The Web server gives end users an HTML form to fill out. This form then goes back to the Web server, where it triggers either a Common Gateway Interface script or a Web server API call to Object Design, Inc.'s WebConnect middleware. WebConnect converts the HTML data into ObjectStore queries. In response, ObjectStore assembles data and text — and soon images and multimedia — into HTML pages that are forwarded to the client browser.

Companies can also use object databases to off-load legacy relational data, construct a complex set of data models to process the data and let Web browsers query it.

One example is using the Web to identify and book airline flights.

In addition, object databases can be employed to optimize network traffic for the Web. One Duhl client has deployed an Internet proxy server, which is used to funnel browser requests from a corporate Web to either internal Web servers or Web servers on the public Internet.

The customer added an object database to support caching and persistence, so the proxy server now stores the information it retrieves and serves it to the browsers.

The result is fewer network requests, reduced data volumes over the network and faster response time for end users, Duhl said.

Object database vendors are adapting their products and adding new features to exploit the burgeoning demand for sophisticated, transaction-oriented Web applications.

Gemstone Systems, Inc. of Beaverton, Ore., next week will announce new products and features for its Gemstone object database, including a built-in HTTP server, and GemScript, a new transaction-oriented scripting language.

Recently, Object Design of Burlington, Mass., unveiled a compact client version of its server-based object database.

FIND IT ON FUSION 5207
Find more info online.
- GTE SuperPages and other Object Design-based sites
- A bibliography on object-oriented databases

Enter the number above in the DocFinder box on the home page.
Network World Fusion
http://www.nwfusion.com

The ObjectStore Persistent Storage Engine (PSE) is a Java applet that downloads to a client computer, and lets the end user store objects and data locally and process them. Microsoft Corp. is licensing PSE for its Java product line (see story below). ■

Object databases boost Web clients

Object databases will form a key client-side element of future Web-based applications, giving desktops local processing capability and a higher degree of interactivity than that found by simply browsing HTML sites.

Microsoft Corp. last month licensed Object Design, Inc.'s Persistent Storage Engine (PSE) for Java, which is a streamlined object store written in Java. PSE is downloaded to the client browser, where it can store and manipulate Java applets, ActiveX components and other applications.

Today, once such Web-based components are run on the desktop they, in effect, evaporate. They have to be downloaded each time they are used.

With PSE, end users can download data, create or run a complex analytical model on it, and then save and reuse the results in subsequent Web sessions, said Eric Magleby, vice president of marketing at consultancy Alta Software, Inc. in Reston, Va.

"Storing this information locally makes a lot of sense," said Joshua Duhl, principal consultant with Stillpoint Consulting in Cambridge, Mass. "For example, you can with PSE store information about the user locally, and then pass it to a Web server, which can use it to customize its responses for that user."

Microsoft has included PSE in its Gallery for Java, a set of libraries (available at http://www.microsoft.com) that are compatible with the Microsoft Developers' Kit for Java.

With the software developer's kit and libraries, software developers can build Java client/server applications that run with Microsoft's version of the Java Virtual Machine on Windows 95 and NT.

—John Cox

A Network World Supplement

December 1996

INTRANet

Hot-wiring wisdom

Trainers are discovering how to use intranets to distribute the smarts quickly and on the cheap. Page 42.

Also inside

- Server hardware a nonissue?
- TRW's applications architecture
- Primer: Streaming audio/video
- Intranets for net management
- Review: Borland's IntraBuilder

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*Circle Reader Service #***7**

Looking for something? Excite on Sun.

Sun, one of the biggest, smartest powers behind the Internet, is now the power behind one of the biggest, smartest search engines on the Web–Excite. PC World was so impressed they gave them an A+ and said, "Quite simply, Excite delivered what we were looking for better than any other engine." All we can say is way to go team. **THE NETWORK IS THE COMPUTER™**

Sun microsystems

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IntraNet

December 1996
Volume 1, Number 6

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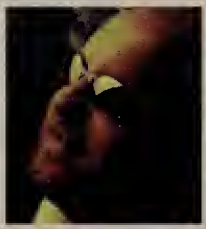
23 Shopping for a box
One of the beauties of intranets is not having to sweat the hardware. Any PC or Mac will serve up your needs. But that will begin to change this year, what with the addition of more multimedia content, the demands of database access and an explosion in pages. Time to put your systems hat back on.

28 Shooting for the stars
Global automotive, space and defense powerhouse TRW launched its intranet for information publishing purposes, but now recognizes it as a critical applications architecture.

35 Intranets as MIS tools: The management thrust
Forget all those other departments for a minute. That technology you've been rolling out has broad implications for your own operations, particularly for network management.

39 Knight-Ridder, Part II
The intranet architect we've been tracking has been promoted to senior vice president of technology. The good news is he's likely to promote the intranet. The bad news is he's too busy with administrative duties to keep the construction on the original schedule.



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Corporate training departments are discovering how to use intranets to distribute the smarts quickly and on the cheap. Cover photo by James Porto.

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From the Editor

Pundits are fond of trying to reduce market phenomenas such as intranets down to matrices and curves and sound bites. It is, after all, what they do.

Some of it works. Some of it is malarky. I liked this one:

A company that visited recently says if you plot intranet application development on a bell curve representing technology acceptance, it falls on that relatively flat area on the far left side.

Geoffrey Moore, in his book *Crossing the Chasm*, calls customers actively investing at this stage the early adopters; the market is slow moving but it is poised for explosive growth up the side of the bell.

Deployment of intranets is higher up the curve, straddling the early adopter stage and the next sector called the early majority. Customers in this sector are wary of bleeding-edge technologies but are eager to adopt the latest goods.

The point is that installation of intranet infrastructures leads the deployment of meaningful applications by a good stretch. While putting up intranet servers and posting human resource information is helpful and interesting, it doesn't do much to further the business. The real promise is when intranets become true business application platforms.

So, regardless of where you fall on the curve, keep your eye on the bell. Your resource requirements will change as you travel along the curve. The further up you go, the greater the promise, but also the greater the commitment required.

That's a sound bite worth digesting.

John Dix, Editor (jdix@nww.com)

Visit our cyberguide to online intranet resources. Select **IntraNet.**
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hot links

insight, humor and other marginalia from planet intranet.

A clean sweep

Corporate intranets are growing like weeds, making it near impossible for Webmasters to keep track of all the sites, pages and hyperlinks.

Internet start-up Site/technologies/inc. has developed a Web site maintenance tool that might just make a Webmaster's life a bit easier.

The product, called Site-Sweeper, crawls across your intranet gathering information on all files. It reports on their size, the date they were last modified and their type — text, image, audio or video.

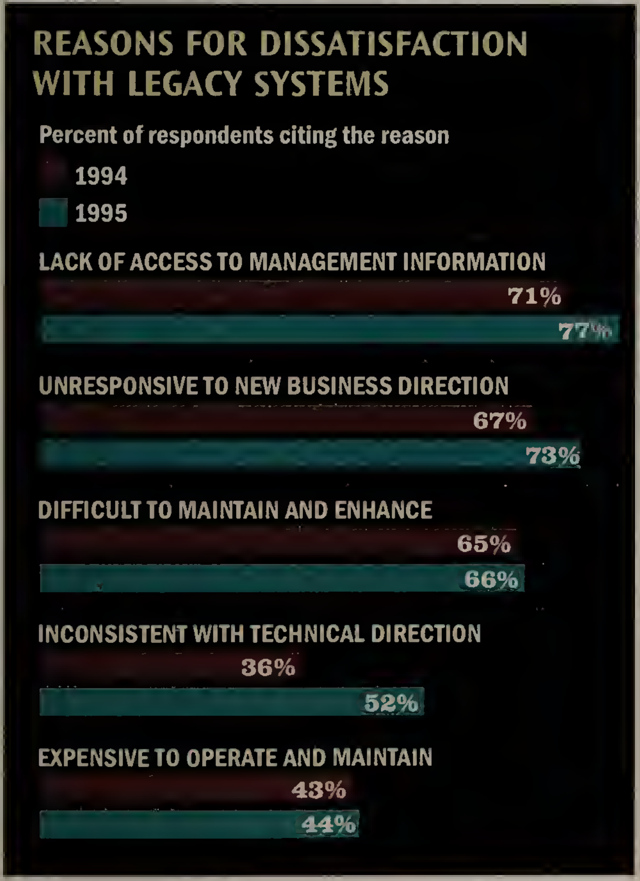
The software, which supports multiple servers regardless of operating system, can detect broken links and identify incorrect image references.

What's more, the software evaluates the number of images on a page, the total download size and links to other pages.

SiteSweeper generates reports, either on demand or per a schedule, that incorporate information from all the servers scanned.

The maintenance tool also comes in handy for making sure secure intranet sites aren't being compromised: SiteSweeper offers an authentication feature that lets an intranet manager enter a password to crawl internal password-protected sites and check their links, the company says.

SiteSweeper, which costs $299, is available on the Web at http://www.sitetech.com.



SOURCE: Deloitte & Touche

A big opportunity?

A recent survey of 431 CIOs by Deloitte & Touche Consulting Group showed that 43% of CIOs are dissatisfied with their legacy systems, up from 40% the year before. The company said "the lack of easy access to information and difficulties in responding to changing business direction have historically been, and continue to be, the most significant causes of dissatisfaction."

Hmm. Just the things intranets improve. Looks to us like a giant opportunity. How about to you?

Cybermuseum showcases winning Web sites

Intranet helps judges organize and track entries

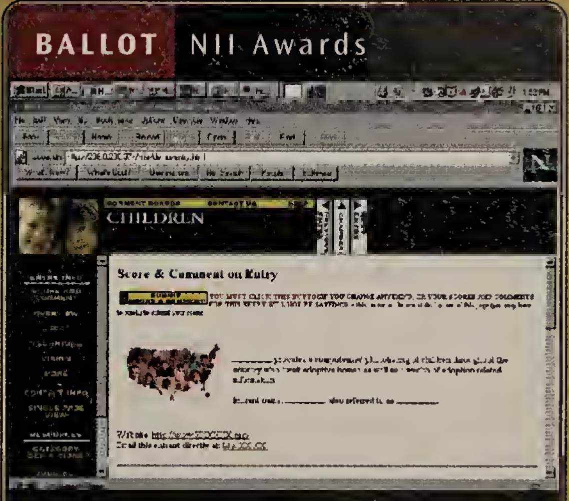
Appropriately enough, an intranet is being used to host the entries in the National Information Infrastructure's (NII) annual awards for Web site design, giving judges single-stop viewing.

The NII contest drew more than 825 entries from around the world competing for awards in nine categories, among them education, government and art and entertainment. First, the competitors registered and submitted entries online, then the 180 judges visited the cyber display to complete Web-based judging forms.

Winners will be announced this month, and the cyber doors thrown open to all visitors (giiawards.com).

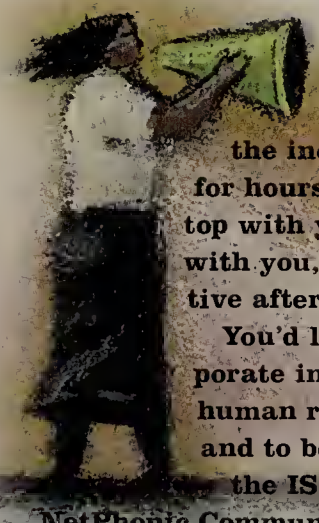
The intranet is based on a Netscape Communications Corp. Enterprise Server running under Solaris on a Sun Microsystems, Inc. server.

The NII awards are managed by Access Media, Inc. of Santa Monica, Calif. Among the more than 70 sponsors are the Academy of Television Arts and Sciences, the Corporation for Public Broadcasting and the American Medical Association.



Online ballots such as this are being used to rate competing Web sites.

Calling all Web pages



You're sitting in an airport lounge, cursing the inclement weather that has delayed your flight for hours and ruing your decision not to bring your laptop with you. At least if you had your computer along with you, you're thinking, you could still have a productive afternoon.

You'd love, for instance, to be able to tap into the corporate intranet. You've been meaning to check the human resources site for updated benefit information and to begin a Windows 95 training module offered by the IS department.

NetPhonic Communications, Inc. of Mountain View, Calif., has just the product for you — a voice browser. If you had the company's Web-On-Call browser, all you'd have to do is pick up a phone — even a cellular model — call the corporate Web server and listen as the content is read. You could even navigate through the site by using the "#" key.

Intranet builders simply need to install the Web-On-Call software on the server. The software uses a text-to-speech (TTS) engine and an audio recording feature to read the exact text on the HTML page. Graphics can be delivered via fax, E-mail or regular mail.

The product is currently available for Sun Microsystems, Inc.'s SPARC platforms, with releases for Microsoft Corp.'s NT and Silicon Graphics, Inc. hardware planned, NetPhonic says.

Prices vary with the number of lines and system configuration. You can expect to pay about $1,000 per telephone line. For a demonstration go to NetPhonic's Web site: www.netphonic.com.

hotlinks

Yee-Ha! It's YooHoo!

It's the little things that can really drum up enthusiasm for the corporate Web. So, advises Web consultant Steven Champeon, jazz up the Web with some nice-to-haves that will capture the hearts of employees, especially those that don't have technical backgrounds. As an example, Champeon points to the corporate phone directory he developed for a former employer.

Playing on the popularity and name recognition of the Yahoo! search engine used on the World-Wide Web, Champeon created the corporate YooHoo! directory. He initially used Perl with a flat file, then moved to a Minerva SQL database with a Java administrative interface.

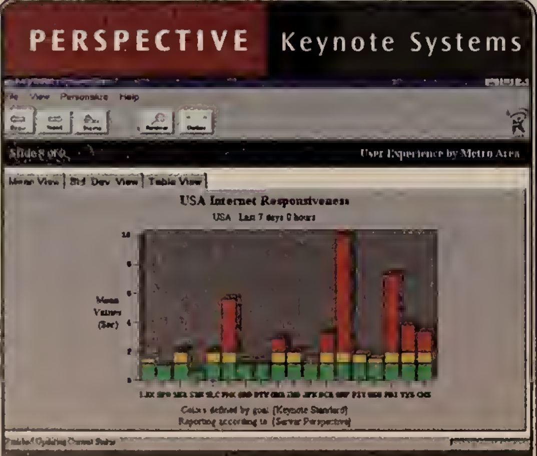
Rather than just a text presentation of phone numbers and mail addresses, YooHoo! included photos scanned from employee ID badges and hyperlinks to projects, job descriptions, personal home pages and other personal information. Employees kept their own listings up to date.

Another valued application developed by the intranet team was an office and employee locator called WhoSitsHere? This helped employees at the company — which moved five times in three years to accommodate growth — keep track of each other's whereabouts, Champeon says.

When employees really get into the Web, they start thinking up creative things to do with it on their own, Champeon says. Some workers, for instance, began posting traffic conditions on the Web and so that other employees could dial in before they left home to get a fix on their commute times. The intranet developers used a shadow annotations utility to support this application.

Error! Server busy

A company with a year-old Web site was rather proud of the 400,000 hits it was getting each day. But the Monday after some routine upgrades were put in place, hits leveled out at 700,000. The company had been shutting out some 300,000 users.


PERSPECTIVE
Keynote Systems
File View Personalize Help
User Experience by Metro Area
Mean View | Std Dev View | Table View
USA Internet Responsiveness
USA Last 7 days 0 hours
Mean Values (Sec)
Colors defined by goal (Keynote Standard)
Reporting according to (Server Perspective)

Perspective allows companies to gauge response times as seen by intranet users.

Unlike call centers that collect information about call holding periods and number of hang ups, the Web provides zero tools for tracking how your site is treating customers. The last thing you want to do is hobble your intranet before it gets going.

Keynote Systems, Inc. wants to change that. It has developed a product called Perspective that makes it possible to gauge response times as seen by intranet users.

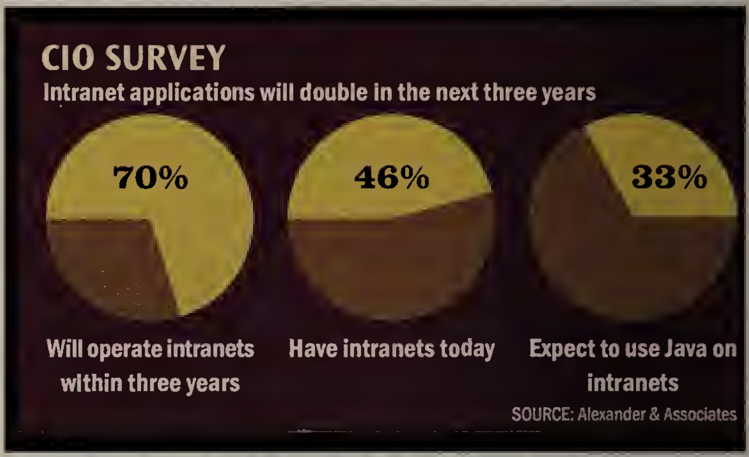
Perspective Agents are deployed around the intranet, given a list of company URLs and told how often to pound on them. The agents measure the response times and feed the data up to a server.

Company President and CEO Jim Barrick says centralized intranet content is often impossible to get remotely, which is ironic since much of it is designed to help remote workers. Perspective is in beta test now and expected to be released in January.

Java skeptics

Senior IT professionals aren't sure what to make of the language, but programmers and line managers boost it.

Java has a PR problem among upper level IT managers, who worry about security and standards.



SOURCE: Alexander & Associates

A survey by management consultants Alexander & Associates in New York shows that lower level IT staff and managers are enthusiastic about Java and that the brass will listen to the programmers' opinions. However, senior IT managers consider Java "an immature language that has yet to be standardized," the report says.

Java's benefits — cross-platform development, communications efficiency and real-time functions — are not perceived as advantages, says Robert Alexander, president of Alexander & Associates. "The survey proves that CIOs really need to be educated about the benefits of Java," Alexander says.

Alexander surveyed 100 CIOs at companies with at least 5,000 employees. More than half of those surveyed — primarily Fortune 1000 companies — had no Java programmers on staff.

Intranets outpace the 'Net

Zona Research says corporations are buying in big.

Intranets will be hotter than the Internet by the end of the decade, says Zona Research, Inc.

Zona projects that systems, tools, Web authoring applications and services marketed for intranet use will nearly double every year for the next three years, ending the decade outselling similar products for use on the Internet two to one.

Corporations are quick to recognize the value of intranets and commit to the technology, while consumers are slow in shelling out for Internet products, suggests Stephen Auditore, Zona's president of the Redwood City, Calif., market research.

The company evaluated components such as system and communications hardware, authoring technology, browsers and connectivity costs. Only the browser market is forecasted to stay flat.

"We still see the intranet market as the most significant opportunity over the short-to mid-term," Auditore says. "We believe it will be several years before we see wholesale adoption of Internet technologies."

INTRANET MARKET 1996 TO 1999

	1996	1997	1998	1999
Systems hardware	$1.3 billion	$2.7 billion	$4.6 billion	$6.6 billion
Server communications software	$802 million	$1.6 billion	$2.8 billion	$3.9 billion
Communications hardware	$535 million	$1.1 billion	$1.8 billion	$2.6 billion
Authoring software	$17 million	$54 million	$118 million	$167 million
Retrieval software	$53 million	$113 million	$179 million	$255 million
Browsers	$30 million	$32 million	$33 million	$33 million
Connectivity	$1.5 billion	$2.7 billion	$3.9 billion	$5.5 billion
Services	$1.3 billion	$2.8 billion	$4.5 billion	$6.5 billion
Online services	$426 billion	$904 billion	$1.9 billion	$2.8 billion
Total	$6 billion	$12.1 billion	$19.8 billion	$28.4 billion

SOURCE: Zona Research

CEO: I want the Internet to build my business!

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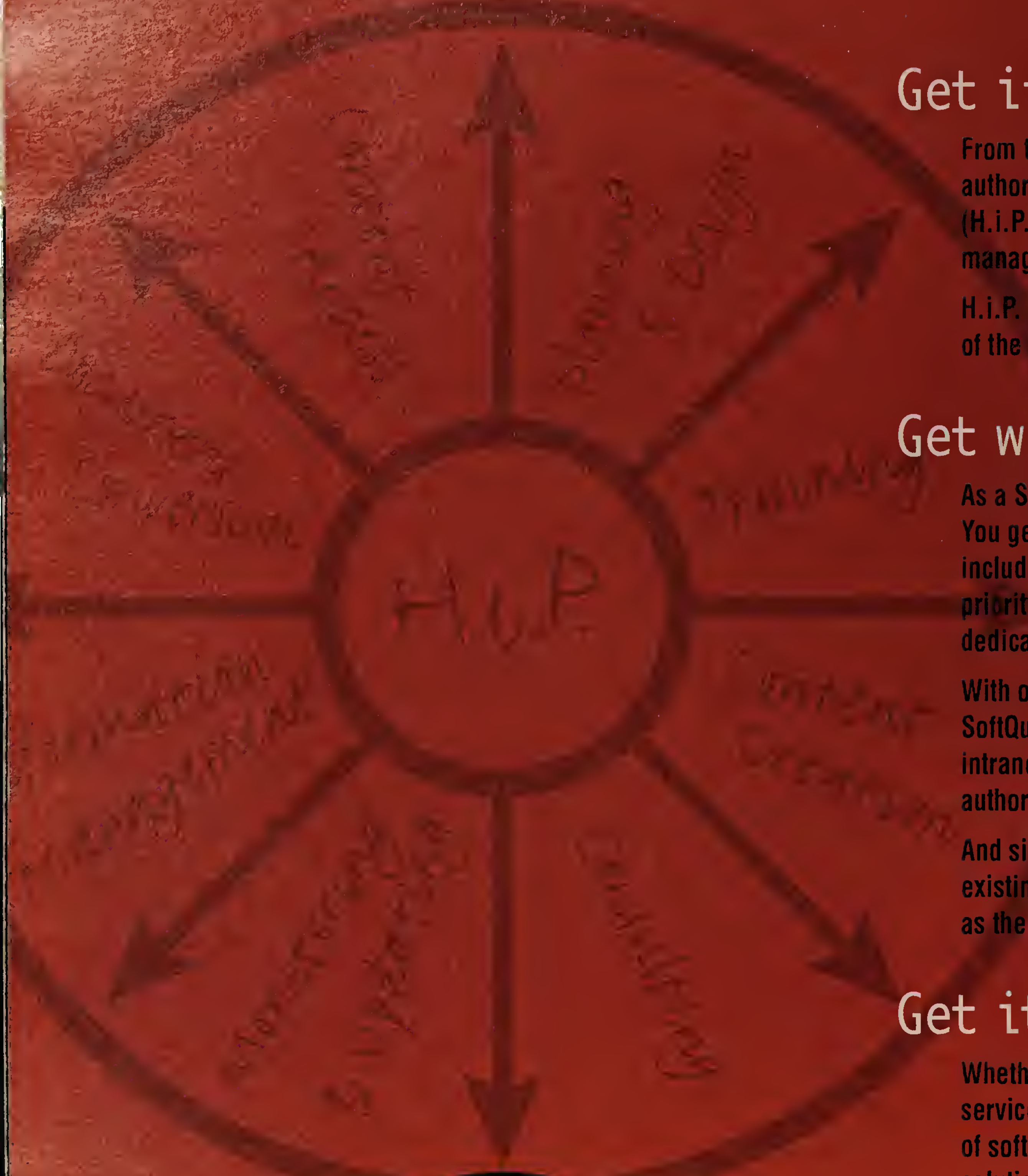

Get it all.

From the developers of HoTMetaL PRO, the award-winning HTML authoring tool, comes SoftQuad's HoTMetaL Intranet Publisher (H.i.P.) – the most powerful solution for creating, accessing, and managing content over corporate intranets.

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Circle Reader Service #6

Streaming audio and video: Bringing the intranet to life

BY MARK GIBBS

Just you wait: No sooner will your intranet be up and running than it will dawn on the human resources director, the chief financial officer, the CEO or, worse still, all three that they can send their monthly messages to the troops via audio or video.

Imagine what it would be like the first Monday morning of the month. In a 90-minute period, several hundred, maybe thousand, employees log on to the intranet, click on the home page icon for the CEO's message and begin retrieving a 6M- or 8M-byte video file. Needless to say, most networks would be stressed to the breaking point.

Audio and video files are big: One minute of uncompressed CD-quality audio is typically around 10.5M bytes. Even with good compression (say, 100 to 1), a 10-minute program is going to be 10M bytes — a significant file size if it is to be downloaded by many people simultaneously.

Video is even worse. One *second* of uncompressed video is an astounding 27M bytes.

Streaming is a technique used for breaking an audio or video file into chunks and sending those chunks to the user in sequence.

A sound (and video) solution

The solution is streaming, a technique of breaking a file into chunks and sending those chunks to the user in sequence. User software can begin to process the data chunks as soon as it receives them.

For example, a streaming system would break compressed audio data into many packets sized appropriately for the bandwidth available between the client and server. When the client has received enough packets, the user software can be playing one packet, decompressing another and receiving a third.

One of the beauties of streaming is that it makes it possible to reverse (as in, "I don't believe the CEO said that"), fast forward, randomly jump to any point, pause and stop without having to bear the time and bandwidth costs of re-downloading the entire file.

The Internet provided the impetus for the development of streaming technologies. With the effective throughput for many Internet users being something less than 4K bytes/sec, the use of audio and video on the Internet was severely limited.

The first audio streaming product, RealAudio from Progressive Networks, Inc., was an overnight sensation when it was released in early 1995. For the first time, practical audio distribution for any file size was possible. Quality wasn't great, but it worked.

RealAudio is now available in Version 3.0, has vastly better sound quality and has been joined in the market by a host of competing products. Now available are audio streaming helpers for any browser as well as plug-ins for Netscape Communications Corp. Navigator and ActiveX components for Microsoft Corp.'s Internet Explorer. On top of this activity, the first wave of video streaming systems has hit the market.

Dipping into the stream

Streaming audio and video systems use an encoding process for compressing and packetizing the datastream and a decoding process for managing buffers according to available bandwidth, decompressing the packets and rendering the contents. Most products available today are based on proprietary technologies, making interoperability among them problematic.

Because coder/decoder systems usually focus on squeezing data to a size that matches the available bandwidth, they are "lossy." This means they degrade the quality of data.

Lossy compression is one of the reasons for the proprietary nature of existing products. By matching the compression and decompression algorithms, you can apply heuristics to approximate lost data and improve the quality of the rendered data.

With audio streaming, the quality of the output depends on the type of sound source as well as the delivery bandwidth. If a streaming product is used with the wrong audio source or over

See Handbook, *page 12*

STREAMING WARES

Product	Company	Phone	URL
	Audio streaming		
Internet Wave	VocalTec	(201) 768-9400	vocaltec.com
RealAudio	Progressive Networks	(206) 447-0567	realaudio.com
StreamWorks	Xing Technology	(805) 473-0145	xingtech.com
ToolVox	Voxware	(609) 514-4100	voxware.com
TrueSpeech Internet	DSP Group	(408) 986-4300	dspg.com
	Video streaming		
VDOLive	VDONet	(415) 846-7700	vdolive.com
StreamWorks	Xing Technology	(805) 473-014	xingtech.com
Vosaic	Vosaic	(310) 352-3147	vosaic.com
InterVu MPEG Player	InterVu	(619) 350-1600	intervu.com
IP/TV	Precept Software	(415) 845-5200	precept.com
	Multimedia streaming		
Shockwave	Macromedia	(800) 470-7211	macromedia.com
Enliven	Narrative Communications	(617) 290-5300	narrative.com
PointPlus	Net-Scene	(972)-9558260	net-scene.com

ASK DR. INTRANET

David Morro is in for consultations. He'll help diagnose your intranet ailments or recommend corrective measures. Send your questions to dr.intranet@nww.com.

In last month's column, you briefly mention HTTP cookies. Can you explain these in more depth and give some examples of how they come into play on an intranet?

HTTP, the protocol used to connect to intranet and Internet Web sites, is sessionless. This means when you request a page from a site, the site doesn't retain any information from that request. With each request, even if immediate, it's as if the user is starting fresh. Cookies are kind of a workaround for the sessionless nature of HTTP.

A cookie is a bit of information a Web server stores on a user's hard drive after he makes a request. As the user makes additional requests of a site, the browser passes the cookie back to the server. This lets information persist across multiple requests and means the content a user sees on a site can change based on his previous actions.

On an intranet, cookies can help personalize the Web experience for employees. You can ask users for their names when they first enter the intranet. A user's name, kept in a cookie, could then be displayed on each consecutive page viewed. Other information commonly stored in cookies include the date and time and the browser's IP address.

For more information, you can find the technical specification on HTTP cookies on the Web at home.netscape.com/newsref/std/cookie_spec.html. You also can go to illuminatus.com/cookie.fcgi for information and useful scripts for applying cookies.

If you're really opposed to the idea of cookies, Netscape Communications Corp.'s Navigator 3.0 browser can warn you when a server wants to apply one. With the proper programming, the browser will show an Alert box that tells you what the server wants to do. It'll also tell you the cookie value and duration.

What is SGML, and how does it fit in with HTML?

SGML, or the Standard Generalized Markup Language, is a decades-old language the International Standards Organization adopted as a method for tagging electronic documents and files. It provides a way to mark up documents so that users can access information on them no matter what computer system they're using.

HTML, the markup language specifically for the Web documents housed in the corporate intranet, is actually a subset of SGML.

There's quite an active community involved in SGML, primarily led by SGML Open, a non-profit industry consortium that encourages the adoption of the language. If you want more information on the group, go to sgmlopen.org. For good resources on SGML, check out coli.uni-sb.de/˜erbach/sgml .html.

Morro is a Web architect at Interse Corp., a Sunnyvale, Calif.-based Web development firm.

With streaming, you can reverse, fast forward, randomly jump to any point, pause and stop without downloading the entire file again.

Handbook, *continued from page 11*

a slow connection, it often will suffer noticeably from distortion, echoing and slurring.

Video streaming is, in comparison to its audio counterpart, much harder to do given the degree of compression required. Consequently, the overall level of these products' output is poor and the screen size of the output limited. For instance, VDONet Corp.'s VDOLive has a maximum screen of 240 by 180 pixels while Xing Technology Corp.'s StreamWorks can deliver 352 by 240 pixels.

Video streaming is prone to displaying a variety of visual artifacts such as blurring, frame loss and solarization. These increase dramatically as the available bandwidth decreases.

At least on an intranet, you should be able to achieve the top end of these systems' frame delivery rate — 15 frames per second for VDOLive and 30 frames per second for StreamWorks.

Serving a stream

A server also may be added to the streaming system to make it easier to provide advanced features such as fast forward and jump. A streaming server also can theoretically provide better service for multiple clients than direct data retrieval through a Web server.

The connection between the client and server is important. Server-based streaming products (for example, RealAudio and StreamWorks) use User Datagram Protocol (UDP), the TCP/IP protocol for sending streamed data. Because of this, these products potentially provide better throughput than those that don't use a server.

Without a server, the data is retrieved via an HTTP connection using TCP. Due to the overhead of TCP's error-correction mechanism, the characteristics of HTTP communications reduce the data rate significantly.

That said, UDP, because it doesn't provide error correction, can degrade performance and rendering quality. However, most of the current audio products handle quite high numbers of dropped packets with minimal degradation.

Within intranets, dropping packets should not be a big problem. The improved performance would make the use of UDP desirable.

Into the flow

Getting these products running on your intranet shouldn't be hard — the leading audio streaming products such as Internet Wave from VocalTec, Inc., RealAudio and TrueSpeech Internet from DSP Group, Inc. are straightforward to roll out. However, documentation is sketchy for some of them.

The encoding and client player components are free in the audio products. Platform support is available for Macintosh, Unix and Windows 3.X, 95 and NT, though only TrueSpeech and RealAudio are available on each one.

Server subsystems are only used by RealAudio and StreamWorks. These are priced by number of simultaneous clients and bandwidth supported, respectively. RealAudio servers start at just less than $2,500 for 10 clients while StreamWorks starts at $3,500 for 1.5M bit/sec service.

In sharp contrast, the video streaming products are expensive.

StreamWorks for video starts at $3,500 for a 1.5M bit/sec server, to which you'll have to add the encoder at $6,500. This is, however, the only product to provide real-time encoding. The other major video streaming product is VDOLive; pricing starts at $1,995 for 10 streams.

Streaming on the intranet

Streaming products will reach their full potential on intranets, as they'll make the distribution of rich and compelling media content practical.

And you should expect to see an explosion of intranet services that trade on streaming techniques. We'll see applications such as newsfeeds, security and process video monitoring become core intranet services. ⊜

Surprisingly 20-45% of employee time on the Net is spent in sites irrelevant to their job, sites such as pornography, games, sports, and even job search. All of which can impact your company's productivity or become grounds for potential legal tangles.

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Borland offers IntraBuilder Standard, IntraBuilder Professional and Client/Server tool suites.

Borland's IntraBuilder 1.0:

Web development dreams

BY MARK GIBBS

"Ambition is the shadow of a dream."
—William Shakespeare

Borland International, Inc. has entered the Web development market with an ambitious product designed to make database back ends for Web servers powerful and simple to develop.

The tool, called IntraBuilder, uses a heady blend of server-side JavaScript and databases to create HTML documents. Wrap that mixture in a typical Borland drag-and-drop graphical development environment, and you have a potential winner for intranet application building.

But Borland has brought this release, Version 1.0, to market too early. The product is stable (as in it didn't crash when I explored it), but it has too many holes to do Borland credit.

For example, the relationship between a form's layout in the Forms editor and its final appearance in a Web browser is frequently tenuous and usually unsatisfactory. While this is a common fault of many Web document editing systems, with IntraBuilder consistency seems even harder to achieve.

What's more, IntraBuilder's documentation is barely adequate. This makes learning the product rather difficult.

I suspect Borland's release of IntraBuilder is yet another example of the vendor community's lemming-like rush to move at the famed Internet-year speed (reputedly equal to five regular years) and to meet the market's belief that product development cycles can be effectively executed in a matter of months. Once again, we have to suffer release du jour.

Flippancy aside, Borland has what could become an excellent product. It has the potential to be a fabulous middle ground between the complexity of coding in Perl or C and the simplicity of most off-the-shelf Web server database systems. (When Borland turns the shadow into a dream, I will want — no, most probably need — this product.)

PRODUCT CAPSULE

- **Name:** IntraBuilder
- **Current release:** Version 1.0
- **Price:** $99.95 for IntraBuilder Standard; $499.95 for IntraBuilder Professional; $1,995 for IntraBuilder Client/Server
- **Requirements:** 80486DX processor or higher; Windows NT 3.51 (Server or Workstation) or higher with 16M bytes of RAM minimum or Windows 95 with 12M bytes of RAM minimum; 30M-byte hard disk space; VGA adapter minimum; Winsock-compliant TCP/IP stack.
- **Vendor:** Borland International, Inc., Scotts Valley, Calif.
- **Contact information:**
  Phone: (408) 431-1000
  Web: borland.com

Naked ambition

Borland's IntraBuilder run-time environment, which is only available under Windows 95 or Windows NT, is architected so the IntraBuilder Broker is a back-end service to a Web server (see diagram, page 18). The Broker provides the interface between the server and one or more IntraBuilder Agents — engines that run the JavaScript applications used for creating and receiving input/ output from Web browsers and for manipulating databases. The Agents can be run on additional copies of Windows NT, so you can distribute the processing across multiple platforms.

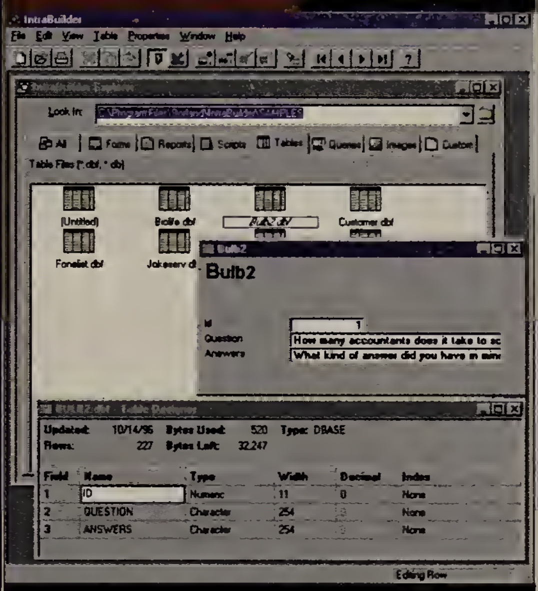
IntraBuilder works with a large number of databases, including the Borland Database Engine tables, DBF and DB files, Microsoft Corp.'s Open Database Connectivity-compliant data sources and a range of SQL database systems. Which ones are available depends on the product version — Standard, Professional or Client/Server — you buy.

The broker interfaces with the Web server through the standard Common Gateway Interface (CGI), Microsoft Corp.'s Internet Server Application Programming Interface (ISAPI) or Netscape Communications Corp.'s Netscape Server API (NSAPI). In case you don't already have a Web server, all versions of the IntraBuilder package include the Borland Web Server. The Professional and Client/Server versions also come with Netscape's FastTrack Server (but for Windows NT only).

IntraBuilder Designer, the application with which you specify tables, forms, scripts and reports, is at the heart of the system. This slick application provides a highly structured framework for developing forms and entire applications. The application is written entirely in JavaScript.

Installation of the system from CD-ROM was a painless, 10-minute process. The setup program allows you to install IntraBuilder and the bundled copy of Netscape's Navigator Gold for editing Web pages. The Professional and the Client/Server versions offer an option for installing the bundled Netscape FastTrack server.

INTRABUILDER Borland



Bulb2

Id: 1
Question: How many accountants does it take to sc
Answers: What kind of answer did you have in min

Updated: 10/14/96 Bytes Used: 520 Type: DBASE
Rows: 227 Bytes Left: 32,247

Field	Name	Type	Width	Decimal	Index
1	ID	Numeric	11	0	None
2	QUESTION	Character	254	0	None
3	ANSWERS	Character	254	0	None

One of the problems of IntraBuilder can be seen here, in the form's odd-looking display.

I tried out IntraBuilder Professional using "The Big Book Of How Many Does It Take To Screw In A Light Bulb Jokes," as my data source. It's a collection of almost 300 riddles on the unlikely subject of repairing light bulbs. I tested the software using O'Reilly & Associates, Inc.'s WebSite Professional Web server. (WebSite is compatible with ISAPI, but IntraBuilder only allowed me to use CGI. Response is slower using CGI than it would be with a Web server configured with ISAPI or NSAPI.)

For the test, I ran Windows NT Advanced Server Version 4.0 on a 100-MHz Pentium board with 32M bytes of RAM in a Chatcom, Inc. Chatterbox Office Series 210-R server. For my client, I used another 100-MHz Pentium board with 32M bytes of RAM in the same machine connected by thin Ethernet. I used Microsoft's Internet Explorer 3.0 and Netscape's Navigator 3.0 browsers.

Ambitious start

My objective was to make a searchable online database through my Web server. I translated the text into a comma-separated variable format, then I imported it into Microsoft Access and exported it as a dBase Version 4-formatted database. I was then ready to begin.

I dropped the database, called Bulb2.dbf, into IntraBuilder's Samples subdirectory, and then in Designer selected the Tables tab and then the database. From there, you can create new tables and examine them in Table or Table Design mode. These modes allow you to browse and edit the table data and modify the table's structure, respectively.

I switched to the Forms tab and selected the

See Review, *page 18*

IntraBuilder comes with ready-to-run applications, including a directory, a guest book and a knowledge base.

PROS AND CONS Borland's IntraBuilder

Pros

- Features a powerful Web database and form generator
- Has a good user interface
- Comes with bundled database access
- Offers lots of wizard assistance

Cons

- Comes with poor and incomplete documentation
- Provides little correspondence between the form as it is designed and as it is viewed in the browser
- Has many bugs and omissions

SUMMARY: This is a potentially outstanding Web database and form generation product which — even in its present, somewhat raw state — could still be a useful intranet tool.

RATING

Value for money	3
Intranet usefulness	4
Quality	2
Overall	3

1 is poor and 5 is excellent

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Review, *continued from page 15*

Untitled form, which automatically runs a wizard that helps you specify the data source and attributes for the new form.

It is at this point you start to get an inkling of some of the product's problems. Note the form's odd display in the screen shot shown on page 15.

IntraBuilder features visual tools and data connectivity.

Problems

One of the irritating bugs is that layouts you create in Designer are unlikely to look the same when viewed with a Web browser. This is because the layout grid Designer uses is translated into a multicolumn HTML table for output and objects — buttons, fields, etc. — are in the cells to attempt to control their screen positions. As a result, hardly visible positioning differences of objects in the forms design window will often look totally misaligned when the form is retrieved by a browser.

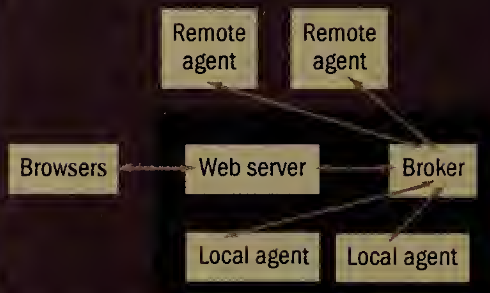
As the programmer, it would be good to have control over the way tables are used, but the actual translation from the Designer representation to HTML is done internally to the IntraBuilder Agents. There is no HTML template or accurate layout control. I suspect once you get experienced with IntraBuilder you'll find a way around these problems, but your choice of form layouts will be limited.

My biggest gripe is with the search facilities. The default for IntraBuilder only allows searches for the target text starting from the left-hand end of fields. For example, if a field contains "blue angelfish," a search for "blue" will succeed but "angelfish" will not. This is bizarre! Why would anyone want or expect such a limited feature? And will users understand the limitation? No, I don't think so.

Actually, this problem has a workaround that requires modifying the SQL search logic defined in the form. However, Borland's helpful product manager couldn't give me the code off the cuff (or, even for some weeks after finishing this article).

RUN-TIME ENVIRONMENT

Borland has architected its run-time environment so the IntraBuilder Broker is a back-end service to a Web server.



Other similar problems are littered throughout the product. They include poor error message texts that really aren't helpful to great voids in the documentation that make it difficult to get inside the product and exploit its strengths.

Programming

If you want to make IntraBuilder really effective, you'll have to get your hands dirty and do some programming. Some limited programming can be done in specifying object attributes in the Inspector mode of Designer. This allows all of the attributes of a form or other object to be browsed and edited.

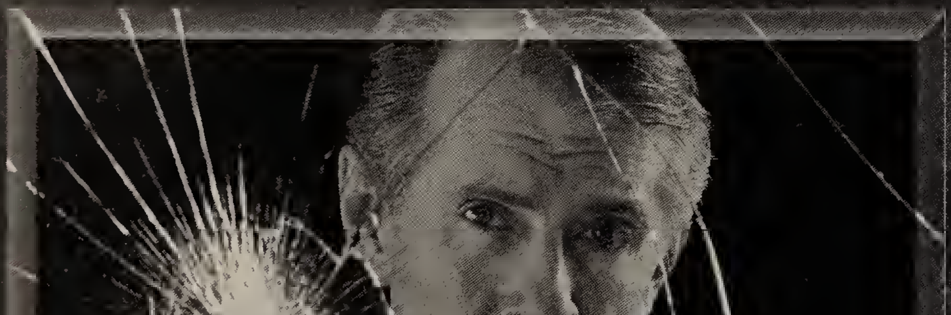
Some of the attributes when modified actually add JavaScript to the client-side form rather than the server back-end processing. This can be extended to allow the client-side form to be sophisticated in things like data validation and the way that forms interact with the user. You also can include Microsoft Corp. ActiveX components.

Borland has extended the JavaScript program with its own classes to provide functions that support its IntraBuilder environment. However, the documentation was not available at review time.

Dream to product

Borland may well be on the track to an intranet winner with IntraBuilder, but it appears to have pushed the product out the door before really polishing it. The company needs to apply itself to completing the product and removing the rough edges. To quote William Shakespeare once again: "Ambition should be made of sterner stuff." ⊜

The tool uses JavaScript for client and server scripting.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NW

Web development tools enter the next generation

BY PEGGY WATT

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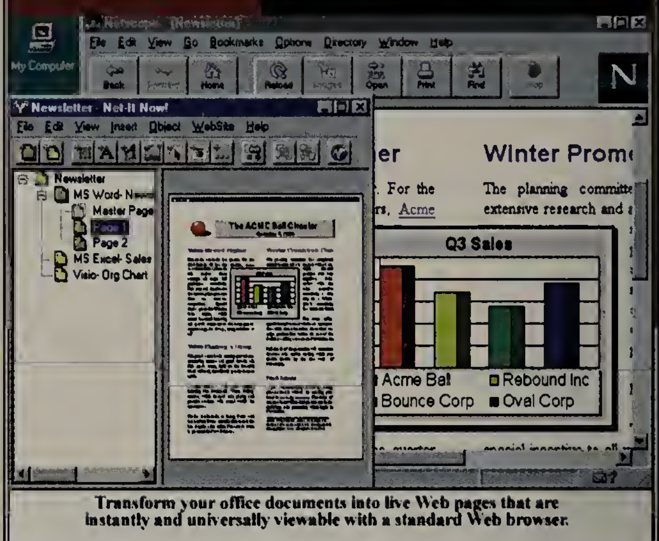

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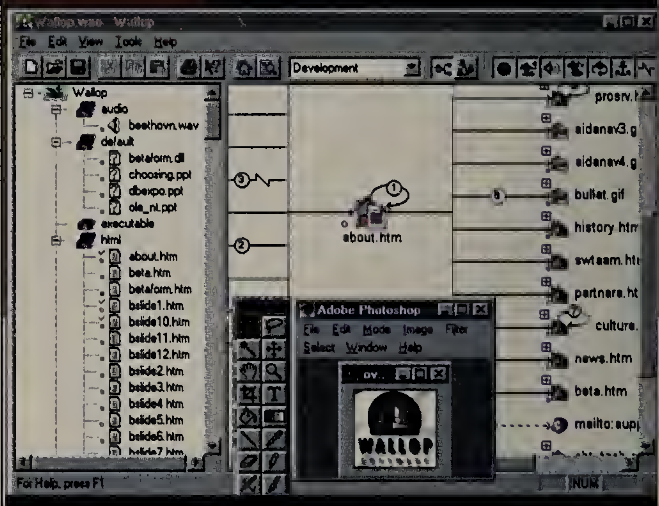
BUILD-IT Wallop Software



Build-IT provides collaborative functions in a development environment integrating users' choice of tools.

You can tell a market is maturing when its tools get more sophisticated, more numerous and even released into the second and third generation. So it is within the intranet arena. The application development environments, editing and publishing utilities, management tools and other instruments of programming being used to design and deploy intranets are no longer a hodgepodge of favorites from past projects.

Today, intranet developers have lots of good Web-specific options to sort through — a task that sometimes is as much a challenge as sifting through the melange of the not-too-distant past. But they don't have to relearn everything; most application development products accommodate programmers' favorite tools along with the Web-oriented new stuff.

Authoring/development tools

Four Seasons Software, Inc. (4seasons.com) combines client/server and Web technologies in its SuperNova application development tool, which it recently updated to help move existing applications to an intranet.

The tool, called SuperNova 5.0//Web, revamps the company's existing fourth-generation language development environment, adding support for Web applications, says Jossi Gil, president of Four Seasons. One new component helps developers Webify any E-mail system by encrypting messages and code sent across the World-Wide Web. The E-mail extension also supports authentication via digital signatures.

Four Seasons added Web technology through object components, Gil says. Developers can create Web applications by generating HTML code objects from the SuperNova environment.

In development for release in the first quarter of 1997 is an application state server component, which tracks transactions to ensure they are completed, addressing the problem of the Web's statelessness, Gil adds. Four Seasons also is adding Java support as an object component.

Pricing for SuperNova 5.0//Web begins at $5,000, depending on the user's operating system platform.

Web development tools are moving into the second generation from several vendors. Allen Systems Group, Inc. recently posted Version 2.0 of its Web Galaxy rapid application development builder for download from its Web site — webgalaxy.net. The tool, which includes new programmer's utilities and feature options, has a graphical interface and generates Java code.

Web Galaxy 2.0 does not require programming. However, the software developers' kit (SDK) in the update gives programmers direct access to the application program interface and includes libraries of Java applets and Common Gateway Interface (CGI) script.

Programmers can build applications that generate either Java or CGI scripts so any browser can access the application, says Dave Bunker, general manager of the company's Web Solutions business unit.

Also new as part of Web Galaxy 2.0 is a forms-generation tool that automates form creation, without requiring programming.

Allen Systems Group requires licenses when its product is deployed on a server; fees begin at $5,000 for a Microsoft Corp. Windows NT system. Client licenses are not needed. Sample applications are posted on the Web at allensysgroup.com.

Another next-generation Web development environment is shipping from Haht Software, Inc. (haht.com), which released an SDK add-on along with an update to its Hahtsite integrated development environment.

The update, called Hahtsite 2.0, is intended to help IT managers quickly move existing applications into Web environments. It includes content generation and conversion tools, programming hooks for linking Web sites to existing client/server systems, and query functions to build into applications. The SDK provides a library of reusable code objects.

The package also provides management tools such as a programming activity log, Web site mapping and several views to check links.

The Application Server component of Hahtsite 2.0 is now available on several platforms, including IBM AIX, Sun Solaris and Windows NT; HP-UX implementation is scheduled to ship in the first quarter of 1997.

The Application Server costs $2,495 per server; licenses for the Integrated Development Environment part of Hahtsite 2.0 are $995 per user. The SDK is priced at $695 per user.

Another new Web-oriented programming environment supports existing object-oriented applications that follow the Common Object Request Broker Architecture (CORBA) standard. Iona Technologies, Ltd. (iona.com) was scheduled to ship last month OrbixWeb 2.0, which links to CORBA objects through Java applets.

The links can be live and retained to provide updates when information in the CORBA objects change, according to Iona. The function is similar to agent technology, but runs as a Java applet on the browser. OrbixWeb 2.0 also supports server-side development, so programmers can build back-end CORBA services into Java programs.

OrbixWeb 2.0 also is compatible with the Orbix Desktop for Windows, which supports Microsoft's ActiveX functions; it also supports, but does not require, Orbix/C++.

The product is available from the company's Web site; the SDK is priced at $2,500 and the run-time license is free.

Developers can mix and match their favorite tools inside the Web application development environment released in November by start-up Wallop Software, Inc. (wallop.com). The program, called Build-IT, provides for "free-range development inside the firewall," says Rob Bolt,

See Product Watch, *page 22*

HAHTSITE 2.0 Haht Software

Hahtsite 2.0 includes a selection of code widgets to help developers Webize existing applications.

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*Circle Reader Service #***16**

Product Watch, *continued from page 20*

the company's chief executive officer and co-founder.

The environment is designed to accommodate a variety of editors, languages, utilities and other programming implements in a collaborative workspace created particularly for Web application development. The development environment provides a single, common view of an application's components, such as code objects, pages, applets and images.

Build-IT supports common Web servers and access by any browser, accommodates basic Web technologies such as GIF, HTML and Perl, and works with emerging standards such as ActiveX, Java and various multimedia functions. It also can import existing applications for further development or testing.

The package, which includes some management functions to track progress, runs on Windows NT and Windows 95 systems. It costs $2,945.

Even as a relatively new Internet standard, Java already invites extensions. Start-up Net-It Software Corp. (net-it.com) is promoting the Java Document (jDoc) format in conjunction with its Net-It Now publishing tool.

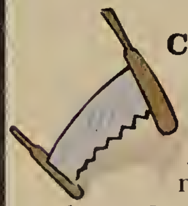
Net-It Now converts existing documents from a variety of common word-processing and publishing formats to a form of HTML that uses jDoc. This means the document immediately supports Java calls and code without needing plug-in functions.

The built-in Java support distinguishes Net-It Now from other document conversion tools, says Dennis Ryan, president of Net-It.

"Net-It Now retains the format of the document before conversion, but Java-enables it for any Java-aware browser," Ryan explains.

Net-It Now also provides management and editing tools for the jDoc pages, but programmers can use Java or any other object-oriented language tools to redesign jDoc pages, Ryan says. The jDoc file also can retain links to the original document and reflect changes to that file.

Net-It, which is soliciting other developers and independent software vendors to support the jDoc format, is working on an advanced version of Net-It Now that will support general multimedia functions. This version of the product, costing $99, supports Windows NT and Windows 95; versions for other platforms are under consideration, Ryan says.



Collaboration tools

StarBase Corp. (starbasecorp.com) has extended its collaborative project management application to reach across the Web. The firm markets a family of applications it calls an integrated team environment, intended to help workgroups communicate and work more easily with remote team members.

StarTeam Server and StarTeam Workstation, introduced last summer, provide traditional client/server architecture for collaborative tasks. Both were recently updated and joined by StarTeam Web Connect, which allows clients to call into the StarTeam environment from any standard browser.

The tools were originally designed to help programmers coordinate a team's work, and many early adopters use the StarTeam family for development, says Bill Stow, StarBase chairman. "We realized we needed to serve workers other than engineers," Stow says.

The product accommodates general project management, offering threaded discussion groups, project and task views and user-defined links among files or documents. The remote access makes it easy to draw in outside contractors or team members who are traveling. A team leader can designate access, either by directory or by file; for example, some data may be designated read-only or not available for simultaneous access, to prevent overwrites.

"In our company, we're down to about one-tenth of the meetings we used to have, by using the StarTeam environment," Stow says.

Web Connect, the Web interface to StarTeam Server, works with any HTTP server, and StarTeam can interface to Lotus Development Corp. Notes via the Domino Web server, Stow says. The program integrates through Microsoft's Messaging Application Programming Interface (MAPI) to most E-mail systems, so mail messages can link to files in StarTeam.

Both the StarTeam 2.0 Server and Web Connect server are priced at $995; licenses for StarTeam 2.0 Workstation cost $549 per desktop.

A new conference server from DataBeam Corp. (databeam.com) is designed to provide collaborative functions to even the most basic intranet. The new software, called neT.120 Conference Server (because of its T.120 compliance), provides real-time, multipoint conferencing features to anyone connecting with an HTML browser, regardless of desktop platform.

Clients running conferencing applications such as DataBeam's own FarSite, Intel Corp.'s ProShare and Microsoft's NetMeeting can take further advantage of the conferencing features. They may join in whiteboard-style annotations, document editing and live presentations in addition to the basic threaded conferencing.

Network managers install the neT.120 Conference Server as a link to a corporate Web site. One server supports hundreds of conference participants. Add-on functions include links to Microsoft Open Database Connectivity databases, remote management tools, and test and maintenance applications; developers can write their own enhancements and add-ons, such as Java applets, to customize a conference facility.

The neT.120 Conference Server is available in versions for Solaris 2.5 and Windows NT Server; it works with any HTTP server that supports CGI scripting. License prices begin at $495 for a server and support for eight concurrent users; a free evaluation version is available from the company's Web site.

Web servers

Products are pairing and blending, as intranet developers determine the essentials for the well-run Web server. Folio Corp. (folio.com) recently released Folio siteDirector, its Web server that pairs with the Folio data manager to collect and display information in HTML format. The update is being followed by a new version of the Folio infobase builder.

Folio siteDirector 3.0 is the newest version of the product originally called Infobase Web Server. However, siteDirector provides Web management functions and tighter integration with the infobases generated by the Folio flagship product than a standard Web server.

Folio 4.0, the newest update to the infobase builder, is scheduled to ship by year-end. It adds support for ActiveX controls and builds in management options to set access and keep usage records, as needed for intranet or Internet access, says Jay Fiore, Folio's corporate marketing director.

Folio builds infobases by indexing and sorting documents and data files, which can be retrieved by free-form queries. Used with siteDirector, infobase queries can be executed via a browser. Folio siteDirector translates infobases to HTML as needed. It uses Microsoft's Internet Server API and CGI.

Folio siteDirector includes editing tools for Web pages, and supports HTML 3 and HTML extensions such as enhanced graphics and frames, as well as Java scripts. It also generates a dynamic table of contents for a Web site and can map file locations.

Just the Facts

MICROSOFT POSTS ACTIVEX MAC BETA

- **Software developer kit at microsoft.com**
- **Shipping version due by end of year**
- **Integration with QuickTime**
- **Supported by Explorer 2.1 for Mac**

Prices for Folio 4 vary with the license configuration, but start at $295 for a single-user client license and $1,995 for the infobase builder component. Folio siteDirector 3.0 is priced at $9,995.

Also in the world of search tools, Inference Corp. (inference.com) has updated CasePoint WebServer, which can browse and search databases created and indexed by Inference's content manager. It also now integrates with standard firewalls for secure access over the Internet.

CasePoint WebServer has a point-and-click interface for making queries and managing data resources. It uses case-based technology to offer free-form searches that consider context and references for nested searches. It has been deployed in help desk, customer support and sales information applications, the company says.

Inference and Trusted Information Systems, Inc. (tis.com) have shared technology, so CasePoint WebServer can integrate with the TIS Gauntlet family of firewall software, which supports cryptology and security.

The product is available in versions for OS/2, Sun Solaris and Windows NT. Pricing is $3,500 per concurrent user or connection, to a maximum of $100,000 per server for unlimited access.

Web server developer O'Reilly & Associates, Inc. (statisphere.ora.com) is now shipping Statisphere, a Web traffic cop that tracks, graphs, and reports on server activity.

The analysis tool runs on Windows NT or Windows 95 and can analyze log files from most Web servers, including Macintosh and Unix systems. Statisphere generates real-time graphs and updates system statistics every minute.

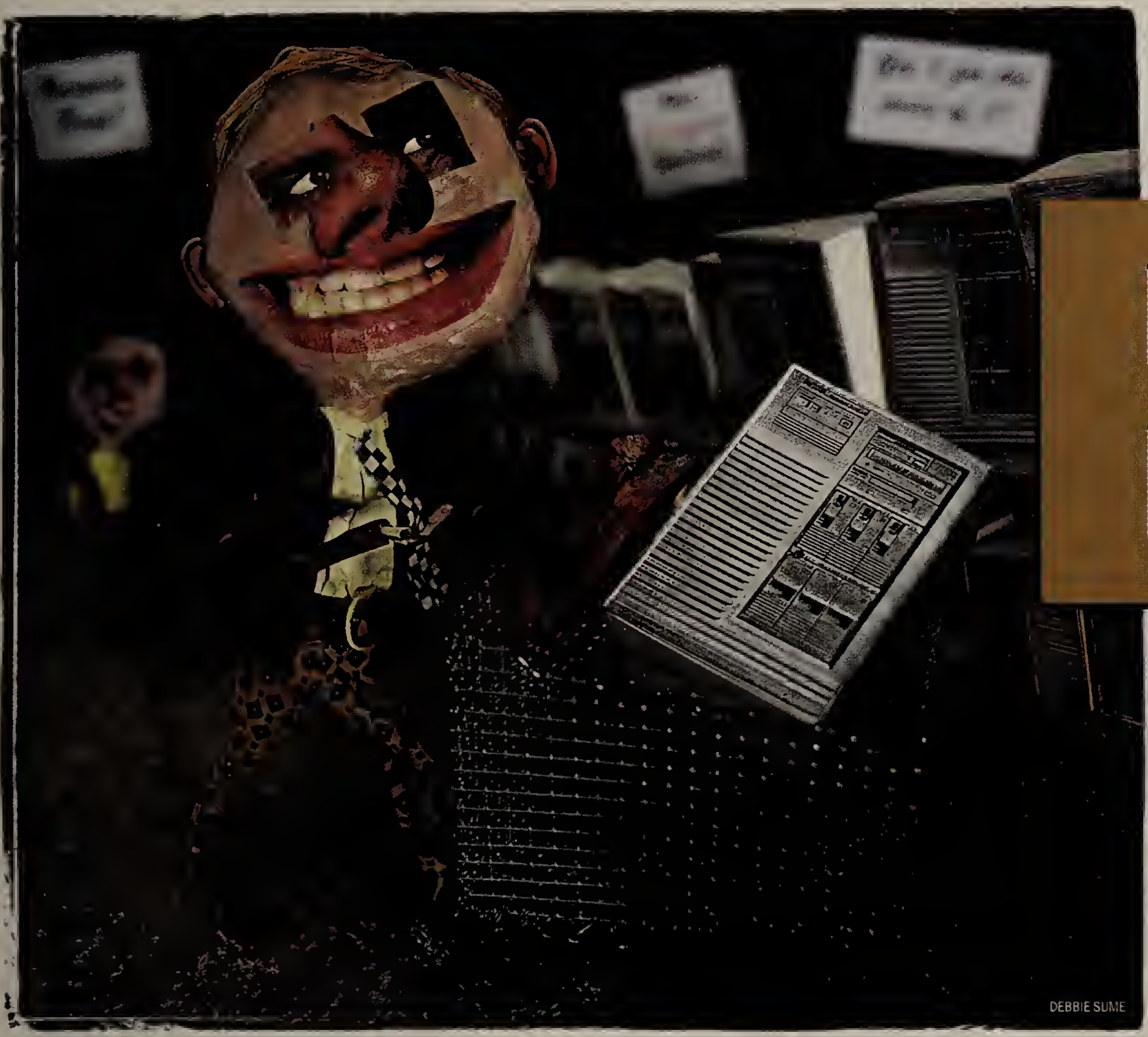
The program can track the number of users that visit a site by day, week or month; determine the most frequently visited sections; identify links to referring sites; and measure traffic during peak periods. It can simultaneously monitor up to 16 servers, and generate logs for each.

Statisphere is priced at $399. ⊜

StarBase describes its suite as software configuration tools that handle many development coordination tasks.

Using the Folio infobase, Webmasters can combine different file formats in a single repository.

Shopping for a BOX


DEBBIE SUME

Emerging requirements complicate the decision about what type of hardware to use when deploying the corporate intranet.

BY JOHN DIX

A server is a box is an intranet platform, right? Any old PC or Mac will do.

Well, yes and no.

Serving static HTML pages isn't much of a strain for your average microcomputer, but changes in the wind should have you thinking twice about the hardware you're rolling out to support corporate Web servers.

Hits are skyrocketing, page counts are doubling every six months and new uses — such as legacy database access — will be more than today's servers can bear.

"Intranets are becoming applications servers," says Mike Mata, director of Compaq Computer Corp.'s Internet Solutions Business Unit. As such, some traditional systems thinking will soon begin to creep into hardware decision making, elevating the importance of availability, manageability, performance and scalability.

If you didn't take any of these into account before dusting off that 486 and plunking it down in manufacturing, don't sweat it. Short term, that's probably all you'll need.

"It's the software that deserves the attention now. Ninety-nine percent of the problems we see involve software," says Kevin Tolly, president and CEO of The Tolly Group, a consulting/test firm in Manasquan, N.J.

That said, you don't want to spend six months tuning your software only to discover your hardware has run out of gas. Now is the time to consider how the evolution of intranet computing should influence hardware plans.

Microgiants

One of the amazing things about intranets is that the processing requirements are so low today. After years of faster, bigger, more, you can now roll out a high-visibility network initiative with nothing more than a handful of PCs or Macintoshes.

For example, while the Mayo Medical Center uses a Sun Microsystems, Inc. SPARCserver 20 to support its home page, the bulk of the center's intranet content actually resides on some 50 other PCs and Macs.

"The big plus is that you don't maintain sessions off the server," says Brian Kaihai, an IT planning analyst at Mayo. "The session is only as long as it takes to move the file back and forth."

And that's not long when all you are serving up are static HTML pages. In fact, the typical bottleneck in 10M bit/sec Ethernet environments is the wire, not the computer, says Compaq's Mata. The box can serve up as many files as the network can accommodate.

TROY FIELDS

"Intranets are becoming applications servers," says Mike Mata, director of Compaq's Internet business unit.

Apple Computer, Inc., for example, says it can support up to 100,000 intranet clients with a pair of Macintosh 8550/200s configured in an array, each box outfitted with 40M to 60M bytes of RAM and a gigabyte disk drive. "You could have one machine serving HTML and the other supporting databases," says Kate Wormington, a product manager in Apple's AppleNet Internet division.

"Passive publishing doesn't strain the server," agrees Jay Kidd, a director of product marketing at Silicon Graphics, Inc. "Serving up HTML pages is easy. The processor doesn't even sweat."

But that's today. It won't be so easy tomorrow.

The converging forces that will stress intranet servers include everything from an explosion in the number of stored pages to the emergence of intranet-supported audio and video.

It may evolve like this:

As more users are brought online, more pub-

See Shopping , *page 24*

Servers, *continued from page 23*

lishing opportunities are recognized and page counts begin to grow. Disk space on some of the central servers runs out and server requests slow down as the network loads up.

By the time you recognize the need to add more disk space and either dedicate a 10M bit/sec pipe to the server or move it onto a 100M bit/sec LAN, the processor begins to choke because users have been enriching online content with graphics, photos and other elements that swell page sizes.

The breaking point is reached when people start submitting queries that require the Web server to dynamically generate content, meaning the server has to call a remote database to generate the requested page. So you have to scale up the server by adding another processor and more memory.

But by now the applications on the intranet are beginning to look, act and smell strategic. It's time to start paying more attention to management tools, availability options like redundancy, search engines capable of locating data scattered across the organization, and higher end security options such as encryption. And maybe it's time to add more processor power, memory and disk space to accommodate all of that.

And then comes the multimedia hit. You'll have to beef up your servers to handle the load. But things like streaming video are probably best supported by a dedicated server.

Is this scenario far-fetched? Maybe it is, maybe it isn't. But it's best to think of the worst case now instead of getting caught with your pants down next year.

Consider this anecdote: Digital Equipment Corp.'s intranet consists of 1,100 Web sites that last February supported 400,000 HTML pages. Within six months, the number of pages had more than doubled to 900,000, says Kathleen Pacyna, marketing manager for Digital's Internet server program.

This type of growth is not unheard of among intranet pioneers. And it is only the first indication of things to come.

Environmental demands

Contending with an explosion in content is usually simply a matter of adding disk space. Nothing threatening.

Where it gets interesting is when performance starts to degrade as usage picks up. This tends to be a network problem today.

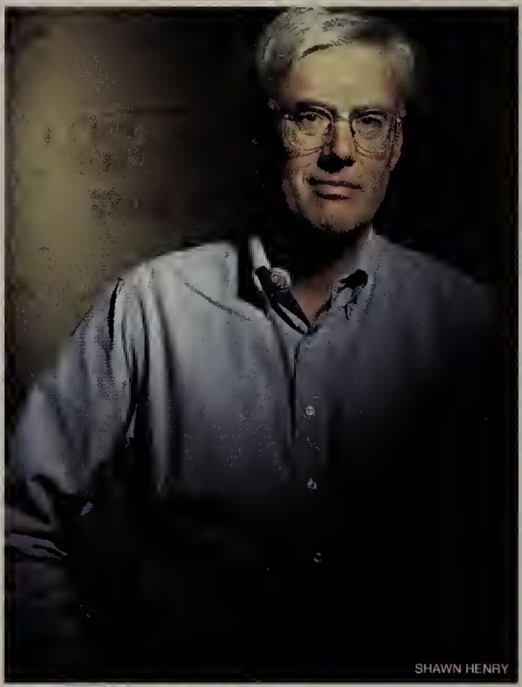
"Once you get past a couple of dozen clients hitting the server at the same time, when you get into the range of half a million bytes per second or more, you'll push past the 10M bit," says Compaq's Mata. "You almost immediately have to go to 100M bit."

And when you beef up the network, the choke point shifts to the server. While a 166-MHz Pentium with 64M bytes of RAM and a fat disk is fine for 10M bit/sec Ethernet, in 100M bit/sec network environments you'll probably want a 200-MHz PC or Mac equivalent with 128M bytes of RAM (maybe more), or even something more powerful like a Reduced Instruction Set Computing-based box from Digital or Sun.

The point is: With the network limits removed, the hardware question, perhaps for the first time, gets interesting. How big? How fast? How much is enough? There are no hard and fast rules here, but experts offer a few thoughts. It depends, of course, on what the server will be called on to do. It's a given that it'll be serving pages. But a page today may be different from a page tomorrow.

Digital says an average page is created using four separate files — for things like logos, icons, text, a toolbar — and each file is 16K bytes.

Pundits say that in a year or two pages may be five to 10 times larger, what with the addition of more images, audio content, video clips, etc. So, if you're sizing your servers based on the number of hits per hour and the average file size, think big. Make your most outlandish guesstimate and then at least quadruple it.


SHAWN HENRY

Serving up dynamic Web pages takes a lot of processing, says Don Young, a systems engineering manager at Digital.

With this precision calculating done, turn your attention to figuring out what percentage of your pages will have to be created dynamically. This is perhaps the single-most demanding new development on the horizon.

"If you pop up a form and say you want the financial information for this cost center, for this quarter and on these projects, to create those pages is going to involve cranking away on the financial database and then serving up the pages on top of that," says Don Young, systems engineering manager in Digital's Internet business unit. "If you're optimistic, that processing is only 10 times the load of a static page. But realistically, it is probably 100 times the load. And this presumes the database is on the server, which isn't always the case."

If 20% to 30% of your files are dynamically generated today, a year from now more than half may be. A single browser request may involve accessing three different databases and 10 database lookups. That's a far cry from serving up a static HTML page. And it changes the complexion of things.

Compaq's Mata says, "As people try to get to more applications through the Web browser — multimedia, back-end databases, transaction processing monitors or information stored in groupware products like Lotus Notes — you are really now talking about a robust application server."

Scaling it up

Because it is impossible to predict how end-user requirements and the mix of data and applications will evolve (how many Java applets are running, etc.), the best thing to do when sizing servers is to build in scalability. Look for symmetric multiprocessor (SMP) capabilities, which enable you to add processors as your needs change, and support for clustering, which provides the ability to string together processors.

Most high-end PC-based servers can support four-way SMP. You can pack a Compaq Proliant 5000, for example, with four Pentium Pro processors. The same is true of NetFrame Systems, Inc.'s NF9000.

You don't get the same bang for your buck each time you add a processor, warns Compaq's Mata. "You get considerable additional performance with the second processor, and very good with the third. But the fourth doesn't get you much because of all the layers of software."

Don't forget to examine how other elements scale, as well. NetFrame touts the fact that users can hot-swap PCI boards, disk drives, power supplies and fans in the NF9000 without shutting down the system. Memory can be scaled up to 2G bytes, disk space to 500G bytes. The box comes with a single 486-based I/O processor, but can handle up to eight.

NetFrame says the dedicated I/O processors help overcome traditional bottlenecks by isolating low-speed I/O traffic from high-speed memory and I/O functions.

Of course, if you begin with a high-powered RISC-based box, you won't have to worry about scaling as soon as you would with a PC or Mac. But when you outgrow a RISC system, there is no comparing how these systems scale.

Consider this: When Digital began offering its AltaVista search engine (altavista.com), it ran it on a Digital Alpha system with two CPUs. That sys-

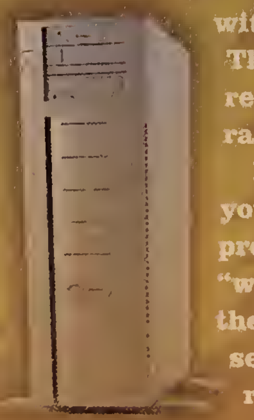
HOW MUCH IS ENOUGH?

A look at memory and disk configurations

If you have bitten the bullet and decided to upgrade a few core intranet servers to 200-MHz Pentium boxes, one of the first questions will be how much memory to stuff in there and how to configure the disks.

Mike Mata, director of Compaq Computer Corp.'s Internet solutions business unit, says think big when it comes to RAM. With typical types of data, a Compaq ProLiant 1500 supporting several hundred clients will provide four times the performance in terms of total bytes per second with 128K bytes vs. 32M bytes of RAM. "Thirty-two is not enough, and 128 is probably more than enough," Mata says.

In a large file environment with some Common Gateway Interface mixed in, you only pick up a 10% to 20% boost by going from 32M bytes to 64M bytes of RAM. But you almost double performance when you jump up to 128M bytes, Mata says.



Although he hasn't examined it closely yet, Mata suspects even 128K bytes won't be enough for multimedia Web servers. "My suspicion is you're going to need something like 256K or 512K because now you are really dependent on caching data streams."

The disk question involves a trade-off between availabilty and performance. If speed is of the essence and a few bits are expendable, as in a multimedia training session where dropped bits won't be perceptable to the user, RAID Level 0 would be desirable: Data is striped across drives without any parity bits for error checking. This does not provide any capability for recovery but does yield maximum transfer rates.

If you're talking about application data, you'll want RAID Level 1 or 5, both of which provide for data redundancy. But Mata warns, "when you get up to a couple hundred clients, there can be a 3-to-1 difference in bytes per second when you get into these RAID environments."

tem has since been scaled up to a cluster of 10 Alphas with 40 processors. All of this was done without taking the system offline, according to Pacyna.

Some of these same clustering capabilites will be arriving soon for PC environments thanks to clustering technology pushed by Compaq, Microsoft Corp. and Tandem Computers, Inc.

Compaq's first products based on this effort will make it possible to improve server availability by enabling one device to back up another. In the coming year, attention will turn to using clusters to scale up horsepower.

Intranet applications have to mature a bit before this kind of attention is required. But if everything unfolds as described, your average intranet shop may use PCs and Macs as departmental servers and centralized clusters of PCs, Macs or higher-powered RISC-based systems to support core home pages and critical corporate functions.

The point is this: While it has been possible to put little to no thought into the intranet hardware question to date, the grace period is drawing to a close. It's time to start expending some cycles on the platform question. ⊜

FORCES AT WORK

Here are some of the culprits conspiring to tax your intranet servers.

PAGE EXPLOSION

Sun Microsystems, Inc.'s internal Web supports more than one million pages. Digital Equipment Corp.'s has 900,000. It is not uncommon for page counts to double in six-month increments as people wake up to intranet possibilities.

SWELLING PAGE SIZE

An average page today is composed of four 16K-byte files (for things such as text, logos, tool bars, etc.), or a total of 64K bytes. Figure that the addition of multimedia components will swell page sizes by an order of magnitude within a year.

DYNAMIC PAGE GENERATION

If 20% to 30% of all pages are generated dynamically today — the server has to query one or more databases to assemble the page requested by the browser — a year from now at least 50% will be, severely draining server resources.

SECURITY

Maybe 5% of files are encrypted today. That could jump to 20% within a year as more sensitive information is moved onto the intranet, meaning servers will have to expend more cycles on encrypting and decrypting files.

STREAMING VIDEO

So much has been done to squeeze down video that a 90-MHz Pentium Web server can support 15 to 20 video streams while still fulfilling its normal HTML page delivery functions. More streams than that, and you'll want to dedicate a box to the task, in which case the same PC could support between 50 and 60 video streams, according to Vxtreme, Inc. As a rule of thumb, five to 10 users can share a video stream, according to Jamie Rapperport, Vxtreme's vice president of marketing. So if you have 10 concurrent streams, you can support between 50 and 100 users.

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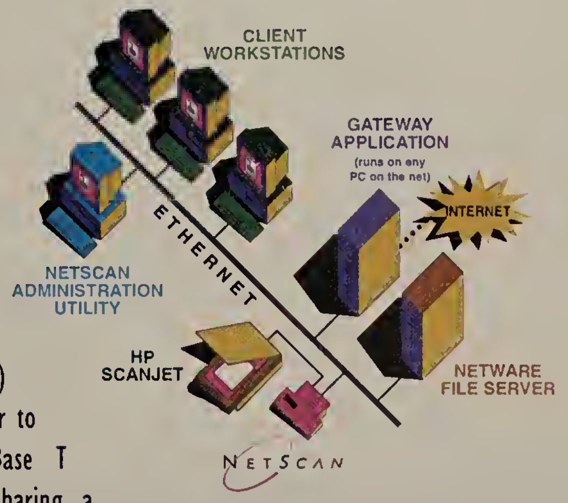

NetScan is to scanners what print servers are to laser printers. Place NetScan in a central work area, plug your ScanJet (models IIp, IIc, 3p, 3c, 4p, 4c) into the NetScan server, connect the server to your network using an Ethernet 10Base T connection, and your users are now sharing a powerful input device.

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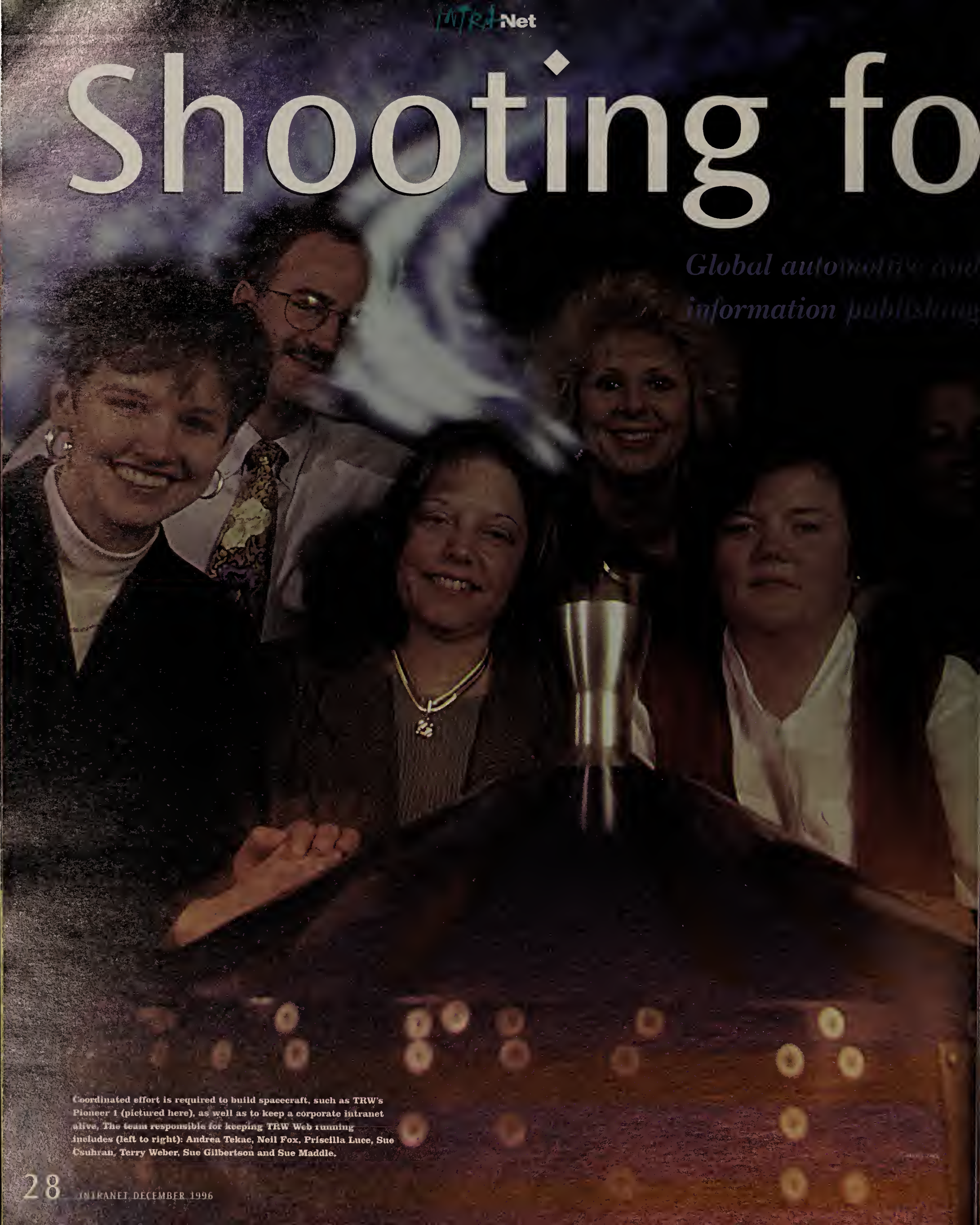
Circle Reader Service #3

Shooting fo

Global automotive and
information publishing

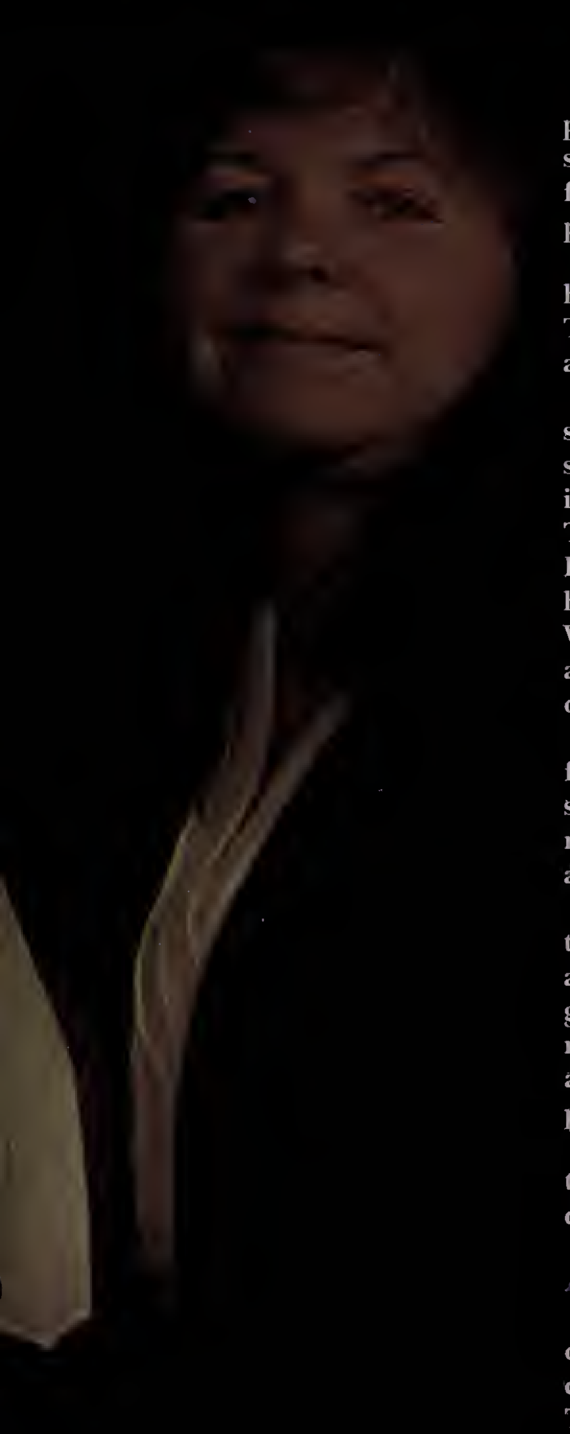


Coordinated effort is required to build spacecraft, such as TRW's Pioneer 1 (pictured here), as well as to keep a corporate intranet alive. The team responsible for keeping TRW Web running includes (left to right): Andrea Tekac, Neil Fox, Priscilla Luce, Sue Csuhran, Terry Weber, Sue Gilbertson and Sue Maddle.

r the Stars

space and defense powerhouse TRW launched its intranet for purposes but now recognizes it as a critical applications architecture.

BY BETH SCHULTZ



A manager at a TRW, Inc. automotive manufacturing plant has just received an unexpected order from a major supplier of car engines. The customer needs valves, and fast. But he is also exerting considerable pressure for low prices.

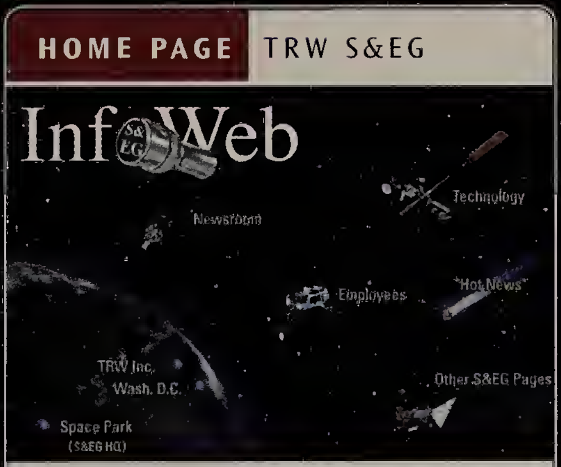
The plant manager knows more than just this one order hinges on his ability to meet the customer's demands. The engine manufacturer has been shopping its business around, and TRW stands to win big.

To fill the order, the plant manager needs to requisition some parts. After getting a quote from one of his regular suppliers, he decides to run a check on companies providing goods to other portions of TRW's massive automotive business. He fires up his browser and clicks his way to the Supplier Data Warehouse, a repository of vendor and product information available on TRW's intranet.

Using a search engine, he quickly finds the names of the top 10 parts suppliers with whom TRW does business. The manager decides to approach one of the suppliers.

The manager has no prior relationship with the supplier, but, leveraging the business other TRW groups do with the company, he negotiates a great deal. In turn, he's able to give his customer a good price on the valves.

The engine manufacturer knows the valves are top of the line and is impressed with the pricing. The company decides to negotiate a long-term contract with TRW.



TRW Space & Electronics Group chose a home page design that reflects its focus — spacecraft.

A new order

Before the Supplier Data Warehouse became available on TRW Web, the plant manager probably wouldn't have checked out other suppliers, at least not for a rush order. The task simply would have been too time-consuming, requiring numerous phone calls and reams of paperwork. The business opportunity might have been lost.

TRW's intranet team considers the Supplier Data Warehouse one of the more mission-critical applications on the corporate Web. "We're under considerable price pressure and we have to be able to do everything we can to reduce costs. This helps," explains Neil Fox, intranet developer and manager of advanced development and applied technology at TRW.

Applications such as this are also helping convince management at TRW's automotive operations that the Web can support a real bonanza of job-related information. This has taken some convincing, given the TRW corporate network is sacrosanct.

The corporate backbone "not only carries Web information but mission-critical data, such as production information for all TRW manufacturing units," Fox says. "Automotive wants to make sure we don't clog the pipe by putting up a nice video that makes one of our seat belt plants go down."

TRW takes the automotive group's concerns seriously because it supplies 65% of TRW's revenue. The group designs, manufactures and sells steering and suspension systems, engine components, occupant restraints and electronics for cars, trucks, buses and off-highway vehicles.

Of TRW's 67,000 employees worldwide, about 45,000 workers draw their paychecks from TRW's automotive businesses.

Given the scope of these units, their buy-in is important to the intranet developers, says Priscilla Luce, the initiator of TRW's corporate Web and vice president of marketing and organizational communications for the $10 billion company, headquartered in Cleveland. Little by little, the intranet team is adding automotive content to the Web, which, until recently, has been the domain of corporate operations and the Space & Defense unit.

For example, the intranet now hosts a site dedicated to Project Earnings Leadership In Tomorrow's Environment (ELITE), a multiyear automotive program TRW initiated in 1995 with a goal of improving operations, reducing costs and speeding time to market.

Project ELITE's three-month-old Web site is pretty basic. It's simply designed to explain what the program is, describe its objectives and provide contact names, says Andrea Tekac, an organizational change communicator at TRW. Project ELITE-related publications are also available via the site.

"This site is important because when we have a major initiative, it's important for employees to know what's going on, whether they're involved or not," Luce says. "We can get information to a broad number of people."

Longer term, the ELITE site will be used to put up best practices devised by different automotive manufacturing groups, Tekac says. "We want to bring people closer to the providers of information. They'll be able to look at the best practices and say, 'Oh, Joe at seat belt systems cut costs by 20% by doing X, Y and Z. Let me call him.'"

While the intranet team has made significant strides in getting managers to appreciate and use TRW Web, it's barely nudged into the consciousness of the general

See TRW, *page 32*

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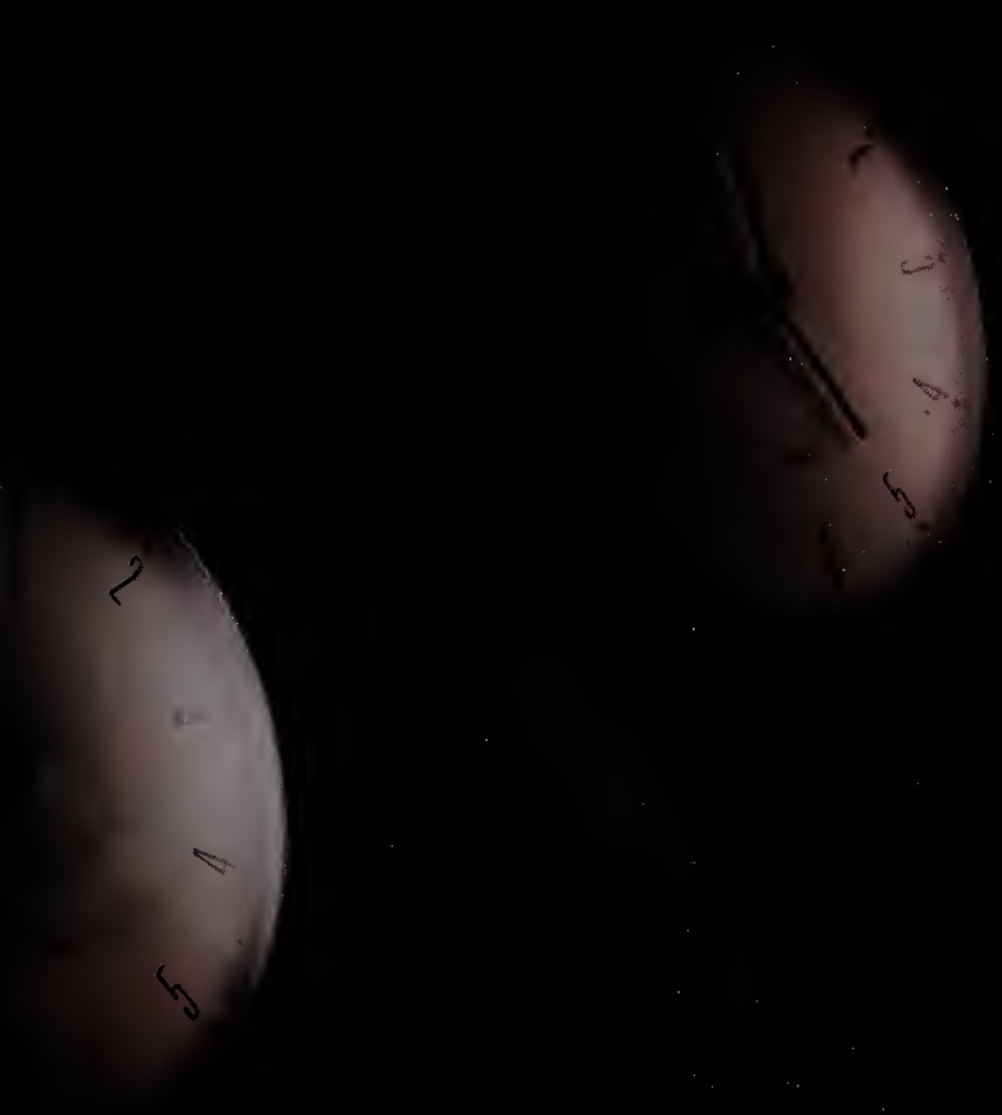
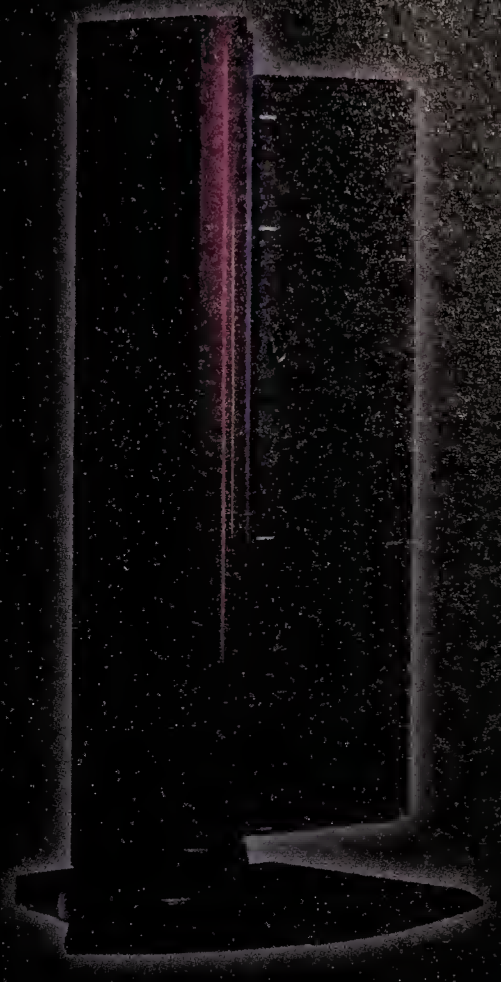
ANETS NEVER STOP.





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Circle Reader Service #20

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TRW, *continued from page 29*

automotive employee population — the workers toiling on the assembly lines and factory floors.

"Our automotive production employees haven't yet shown a need for or an interest in Web access. They don't even have access to workstations," Luce says.

The intranet task force assumes that about half of TRW's population has access to a computer, whether that machine resides on an individual's desktop or is located in a central spot. Of those 30,000 employees who have access to a computer, only about 12,000 have Web connectivity, Fox says. "Our intention is to get access to the Web for everyone."

The technology solution is relatively straightforward: Install kiosks and additional central computers and give everyone on the factory floor access. Content presents a much bigger challenge, Luce says.

"One of the things we need to do with production employees is put the right information in their hands. A lot of what we have on TRW Web right now is intended for managers, administrative staff and engineers. It wouldn't be of interest to production employees," Luce says.

This is an issue with which the TRW intranet task force is only just now beginning to grapple, even though intranet activity dates to early 1994. At that time, unbeknownst to each other,

WEB UNDERPINNINGS

The IS shops in each TRW, Inc. business division have always called their own shots when it comes to computer platforms and applications, but things are changing.

"In the past, the IS departments have been completely independent and left to make their own decisions and strategies. Everyone pretty much worked in a vacuum," says Neil Fox, manager of advanced development and applied technology at TRW.

"Today, the CIO has laid out a strategy of commonality. He wants a single computer platform and common E-mail, word processing and spreadsheet programs."

That degree of sameness isn't expected on the intranet, but coordination of Web assets is a goal, says Fox, who for the next two years will be responsible for managing TRW's intranet strategy. "We can't control things on the Web, but we can direct them," he says. "It will be important for all of the IS personnel to be aware of Web activities and to work together to make sure there's nothing inappropriate going on on the intranet."

At corporate headquarters, Fox is overseeing the migration of Web servers from a Unix platform to Windows NT. "NT seems to provide everything we need, and it's easier to support."

That's not necessarily the case at some operating units, such as TRW Space & Electronics Group and TRW Systems Integration Group, which is loaded with Unix gurus. It wouldn't always make sense for them to follow corporate's lead to NT, Fox says.

While the server choice remains the purview of each IS group, a central intranet task force has made some browser decisions. Web-enabled TRW employees are using either Microsoft Corp.'s Internet Explorer or Netscape Communications Corp.'s Navigator. "People should only be using the overlapping feature set of those environments for developing Web pages," Fox says.

For now, that means developers shouldn't use ActiveX. So far, that hasn't been an issue, says Fox, adding that more of a problem stems from the differences between Microsoft's and Netscape's implementations of Java and JavaScript.

"The implementations are slightly different, so we have to tweak and modify the code accordingly," Fox says.

BRUCE ZAKE

Yahoo-like searching and cataloguing will be available soon, says Neil Fox, intranet developer at TRW.

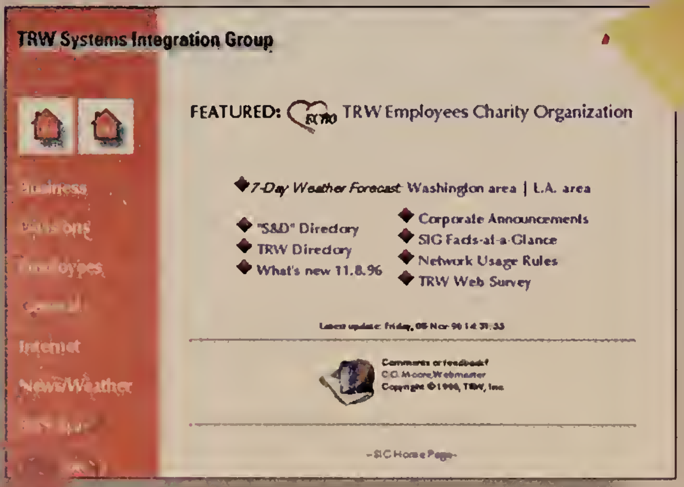
SITE SEEING

A step-by-step guide to one of TRW's intranet sites

The Learning Network

A software developer who works for TRW Systems Integration Group (SIG) has just been assigned to a client that is kicking off a new Unix project. It's been a while since the software developer worked with that operating system, so he decides to bone up on some of the intricacies of Unix.

❶ To begin his refresher course, the software developer logs on to the SIG home page, which provides hotlinks to a variety of information and to other corporate sites. He wants to get to the SIG Infrastructure Support System (SISS), so he clicks on the link SISS Apps.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- *7-Day Weather Forecast:* Washington area | L.A. area
- "S&D" Directory
- TRW Directory
- What's new 11.8.96
- Corporate Announcements
- SIG Facts-at-a-Glance
- Network Usage Rules
- TRW Web Survey

Latest update: Friday, 08 Nov 96 14:31:33

Comments or feedback?
C.G. Moore, Webmaster
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-SIG Home Page-

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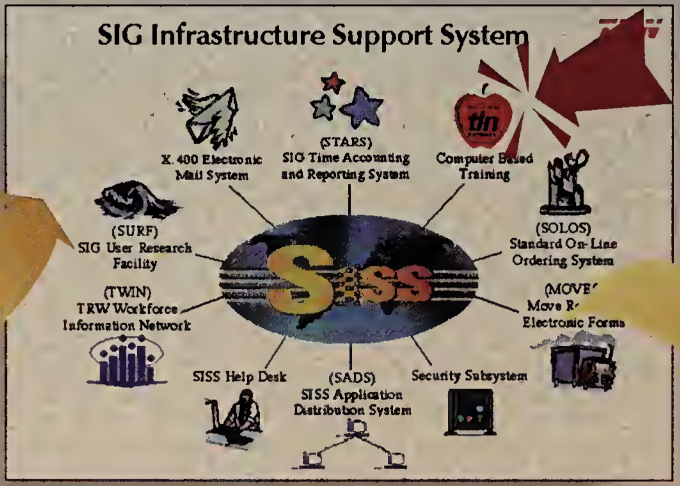
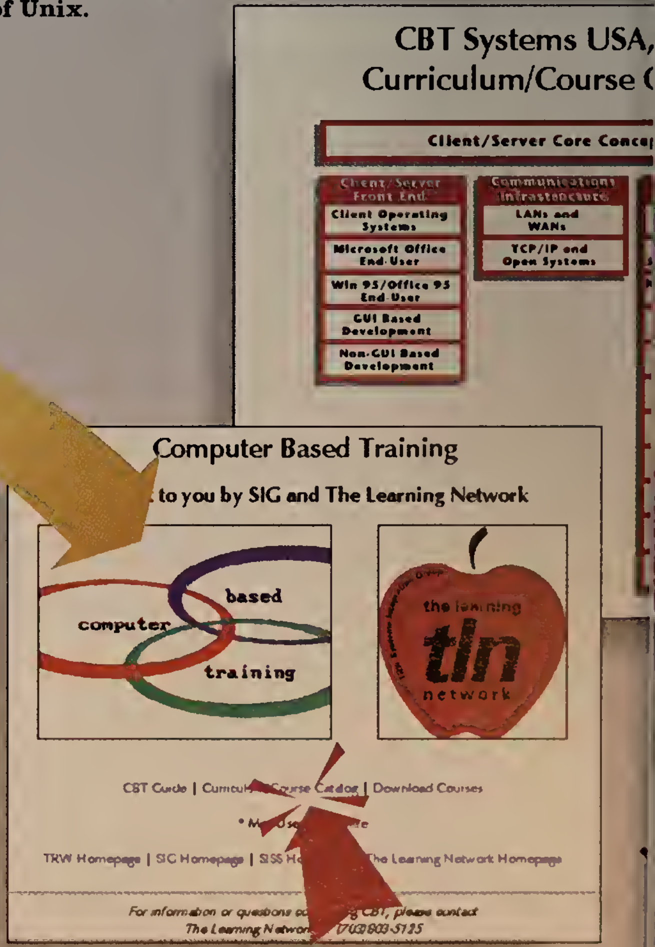
Employees
General
Internet
News/Weather


SIG Infrastructure Support System
X.400 Electronic Mail System
(STARS) SIG Time Accounting and Reporting System
Computer Based Training
tln
(SURF) SIG User Research Facility
(SOLOS) Standard On-Line Ordering System
(TWIN) TRW Workforce Information Network
(MOVE Move R Electronic Forms
SISS
SISS Help Desk
(SADS) SISS Application Distribution System
Security Subsystem

❷ On the SISS page, the developer scans the icons for the familiar red apple, which SIG uses to symbolize its computer-based training efforts. He finds the apple, then clicks on it to access the home page for The Learning Network (TLN).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GUI Based Development	
Non-GUI Based Development	

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TRW Homepage | SIG Homepage | SISS H The Learning Network Homepage

For information or questions co g CBT, please contact The Learning Netwo (703)803-5125 several of the computer-savvy TRW operating units were beginning Web work.

Corporate moves

In Cleveland, for example, Luce launched a program to figure out how to use the computer infrastructure at headquarters for communications purposes. "We started with a meeting of publishers to see if they thought there was any value in electronically communicating what they did in print," she says.

Response was overwhelming, with nearly 30 content providers expressing an interest in distributing their information electronically.

"One of the objectives behind harnessing the power of the Web is that we would be able to deliver to TRW employees consistent information as it was happening," Luce says. "There was a lot of company information that employees in the divisions and operating groups didn't have access to when they needed it — things like the annual report."

To meet Luce's needs, Fox's information resources group built a prototype client/server application that made common data accessible via hyperlinks. No sooner had it demonstrated the prototype when it saw the Mosaic browser. " 'Oh my god,' we said, 'the world has changed!' "

BRUCE ZAKE

"We wanted a tool that the business units themselves would own and use in the manner of most interest to them," says Priscilla Luce, corporate Web initiator at TRW.

Fox's group rebuilt the prototype using Mosaic and the Web and Luce's team presented it to top executives. "We wanted to demonstrate that we could get to TRW information and to data outside on the World-Wide Web," Fox says.

That started the ball rolling toward TRW Web, which now comprises more than 100 Web servers. Initial content included the massive company policy book published by the law department and the corporate phone directory, Luce says.

While Luce was marshaling content providers at corporate, folks at TRW

See TRW, *page 34*

AUTOMATIC HTML

When departments at TRW, Inc.'s headquarters began identifying what they could publish on the corporate Web, the information services group faced a sweet irony: The intranet was so attractive they would have a hard time keeping up with demand.

"We knew we were resource-constrained, so rather than building pages, we decided to build tools," says Neil Fox, intranet developer and manager of advanced development and applied technology at TRW in Cleveland.

For content providers, for instance, Fox's group is building a tool it calls AutoHTML to make Web content creation as simple as possible.

Content providers create documents in Microsoft Word, then drop them in designated folders. A public relations staffer, for example, may store a document in the news folder, Fox says.

The folder resides on a file server mounted on a Sun Microsystems, Inc. workstation, which also supports the AutoHTML program.

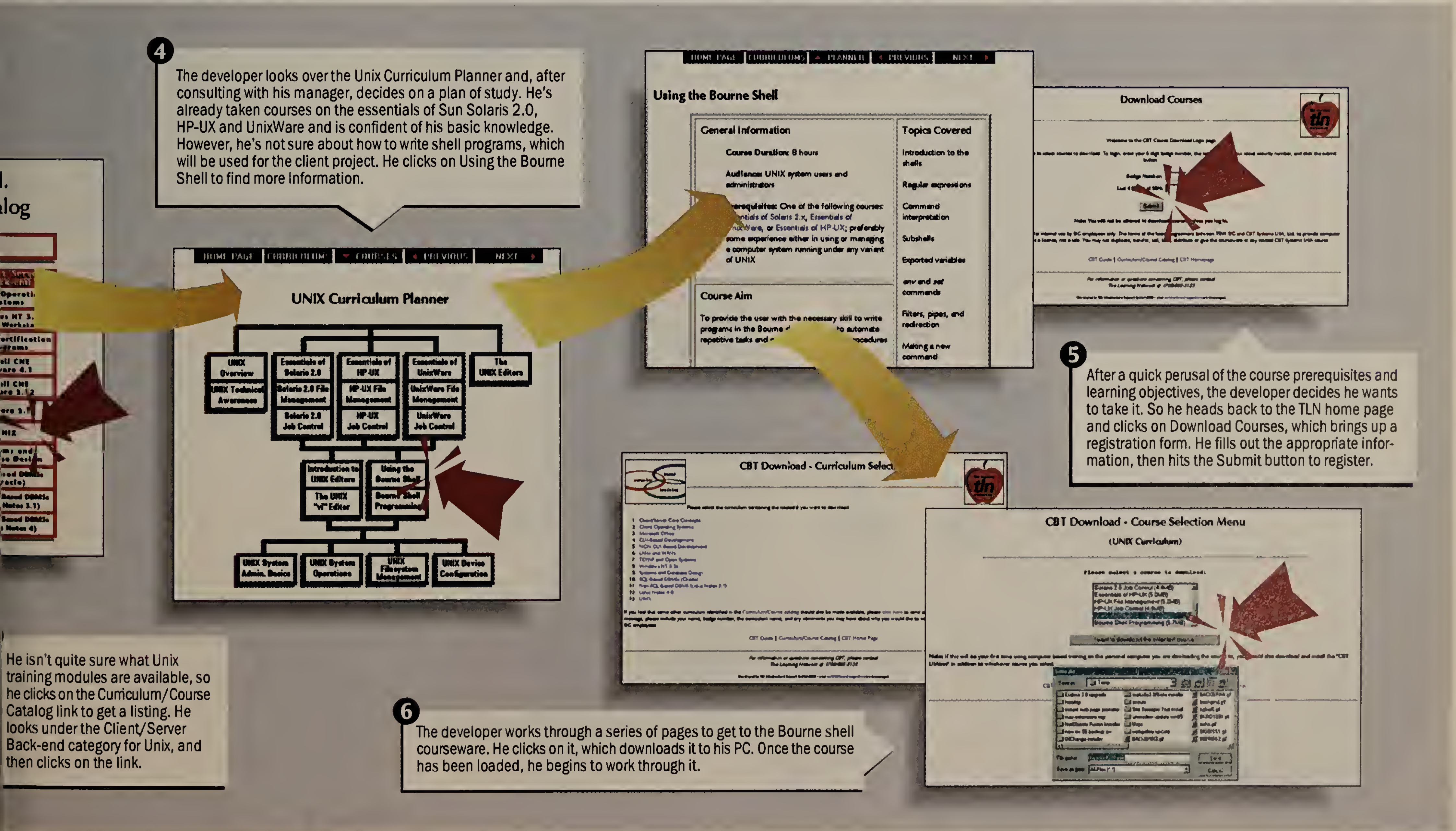
AutoHTML monitors the folders for new documents and, when it finds one, converts it to HTML. The tool then creates a link from the corporate home page.

After five days, the program automatically moves the document off the site and into a central repository. The document stays there for 90 days.

Fox's team has developed one version of AutoHTML, but needs to rework it so it aligns with planned intranet upgrades.

For the corporate operation, Fox is upgrading from a Unix server and writing everything in Perl to a Microsoft Corp. Windows NT server and server-side Java.

"We're anxiously awaiting the new version of AutoHTML," says C.G. Moore, innovation consultant and Webmaster for TRW Systems Integration Group in Fairfax, Va.



Using the Bourne Shell

General Information

Course Duration: 8 hours

Audience: UNIX system users and administrators

Prerequisites: One of the following courses: Essentials of Solaris 2.x, Essentials of UnixWare, or Essentials of HP-UX; preferably some experience either in using or managing a computer system running under any variant of UNIX

Course Aim

To provide the user with the necessary skill to write programs in the Bourne to automate repetitive tasks and procedures

Topics Covered

Introduction to the shells

Regular expressions

Command interpretation

Subshells

Exported variables

env and set commands

Filters, pipes, and redirection

Making a new command

He isn't quite sure what Unix training modules are available, so he clicks on the Curriculum/Course Catalog link to get a listing. He looks under the Client/Server Back-end category for Unix, and then clicks on the link.

④ The developer looks over the Unix Curriculum Planner and, after consulting with his manager, decides on a plan of study. He's already taken courses on the essentials of Sun Solaris 2.0, HP-UX and UnixWare and is confident of his basic knowledge. However, he's not sure about how to write shell programs, which will be used for the client project. He clicks on Using the Bourne Shell to find more information.

⑤ After a quick perusal of the course prerequisites and learning objectives, the developer decides he wants to take it. So he heads back to the TLN home page and clicks on Download Courses, which brings up a registration form. He fills out the appropriate information, then hits the Submit button to register.

⑥ The developer works through a series of pages to get to the Bourne shell courseware. He clicks on it, which downloads it to his PC. Once the course has been loaded, he begins to work through it.

TRW, *continued from page 33*

Space & Electronics Group's (S&EG) Space Park facility and at the TRW Systems Integration Group (SIG) had started working with Web technology, too. "The whole Web idea seemed to take hold synchronously at different sites," says C.G. Moore, an innovation consultant with SIG.

At Space Park in Redondo Beach, Calif., the Engineering Visualization Center created a site for its animation and multimedia projects and began working on other prototypes, says Raminta Jaucokas, head of the center.

Meanwhile, SIG in Fairfax, Va., had a variety of pilots under way, including publication of technical system development materials, Moore says. The SIG site is probably in its fifth or sixth reincarnation now, he adds.

"We would like people to fall face forward on the keyboard and get to where they want to go. If it's not that easy, it's not of much use, so we refine the Web in that direction," Moore says.

The SIG Software Engineering Process Group posts best practices on the Web, while the information systems group provides hundreds of training courses, for example (see Site Seeing, page 32.)

These disparate efforts fit right into Luce's picture of an intranet. "We wanted a tool that the business units themselves would own and use in the manner of the most interest to them," she says. "However, we do have an overriding objective, and that's that everything is connected to everything else."

In other words, TRW didn't want the operating units to establish their own intranets. "So if you click enough times, you can get anywhere in the company," Luce says.

"We're dealing with technical people who have been using these tools for a while, and we don't want to diminish their enthusiasm, but these are company resources. It's within our realm of responsibilities to say: We want you to be a part of the bigger system," Luce says.

Raminta Jaucokas and Dan Sheehy helped create TRW S&EG's home page.

BART BARTHOLOMEW

To work through the intranet issues, TRW has established a task force that pulls from a network of internal communications professionals — the content providers — and technical experts. Luce's group in Cleveland has taken on functional responsibility for the Web.

To help employees navigate TRW Web, the intranet task force devised a three-layered structure for it, with the corporate TRW Web home page at the center, operating unit pages in the middle and department or project sites at the outer layer.

TRW S&EG, for instance, recently put up its own home page, called InfoWeb. "Our objective was to create an umbrella page with links to other sites," says Dan Sheehy, manager of internal communications for the group.

"This makes it easy for engineers and scientists in one division or department to find out what's going on in others," he says.

The TRW home page, which about 30% of the company's 130 operating units worldwide use as their default home page, features a stock ticker and daily news feeds. Since many operating units use this page as their own, this really makes it the "homeless" page, intranet team members quip.

As the operating units turn to the intranet, TRW Web is taking on a much more strategic role within the corporation, Fox says.

"We're moving from a great information publishing platform to mission-critical applications architecture," he says. ⊜

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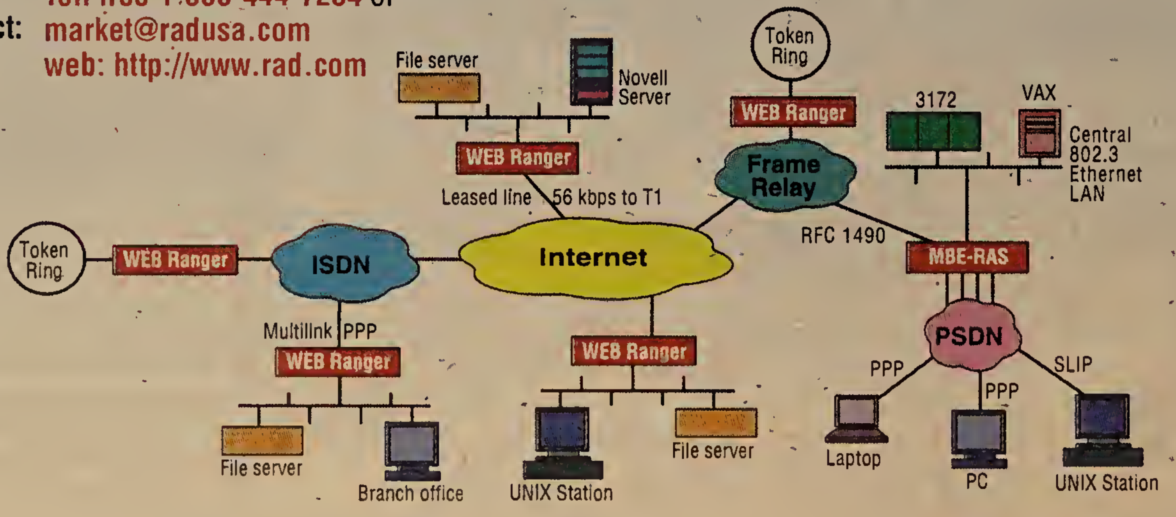

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Circle Reader Service #19

Getting to the POINT

Might the Web browser turn out to be the elusive, longed-for ideal — the universal network management client?

BY ELISABETH HORWITT

RANDEE LADDEN

Corporate IT departments have been helping their user constituencies bring business applications onto the internal Web. But now, browser-wielding network managers are discovering just what the intranet can do for them.

Turner Broadcasting System, Inc., for instance, found that approximately 90% of its Hewlett-Packard Co. OpenView users actually don't need the Unix-based client for the platform — they can get what they need via Web browsers, says Charles Hebert, a senior technology manager for the media giant's software services division in Atlanta. Because browsers are so cheap, this translates into big cost savings over giving everyone a Unix-based OpenView client that averages $50,000 per desktop seat.

Not that Turner is doing away with HP's OpenView console. It's still a must for a core group of users whose jobs require interactive manipulation of OpenView tools, Hebert says. However, he notes, about 15 IT network managers have switched from OpenView consoles to Web browsers.

Plus, Web browsers have made OpenView accessible for the first time to more than a hundred users who just need to check the colors [of icons] to see if something is up or down," Hebert adds.

For example, NT systems administrators recently began browsing OpenView to check the status of NT network links. In the pre-Web world, such occasional users would have found it hard to justify the cost of an OpenView console or spending the time it takes to learn the platform's Unix-based, network-oriented interfaces, Hebert says.

To serve such users, the IT department developed software that lets browsers access the databases and views presented by OpenView and other components of TurnerView, the company's enterprise management platform.

One of the gang

Turner is far from alone. A fast-growing body of corporate users is installing Web browsers as inexpensive, flexible, easy-to-use, system-independent clients for network management platforms and applications. And from there, many are moving to bigger and better things, such as developing their own Perl and Java programs to access information directly from network device management agents such as Management Information Bases (MIB).

Until recently, users have had to supply their own HTTP links and HTML conversions between browsers and popular network management tools. In the past year, however, leading network management vendors — like groupware and database vendors before them — have cooperated with the inevitable and announced their own Web interfaces. This has raised hopes among some IT managers that the Web browser could actually turn out to be that elusive, longed-for ideal — the universal network management client.

Toys R Us, Inc. is one such firm. The toymaker began by using Weblink, Concord Communications, Inc.'s browser interface for its Trakker network utilization monitoring tool. "We found it to be an easy interface for engineers to get at [management] information," such as Trakker reports of

See Management, *page 36*

Management, *continued from page 35*

WAN and LAN segment utilization, says Paul Pansini, manager of network systems for the Paramus, N.J., company.

Pansini's group now plans to implement Web access across its full range of management platforms, including Bay Networks, Inc.'s Optivity, Cisco Systems, Inc.'s CiscoWorks and OpenView. The vendors have paved the way by unveiling their own Web interfaces in the past few months.

"Engineers will be able to resolve problems quicker because they can get at the information in a clear, concise, consistent format," Pansini says.

A browser-wielding network manager would be able to click on a hyperlink to jump from one management tool to the next in order to solve a problem. For example, a manager could access Concord's Net Health reports on LAN and WAN segment utilization, identify a potential bottleneck problem, then call up CiscoWorks to check on the performance and utilization levels of specific routers or hubs, Pansini says. All of this would be accomplished via a consistent graphical user interface, command structure and reporting formats.

"People have been wanting this for a long time; now the browser really provides it," Pansini says. "In the past, we've had to use different terminals, and flip across different screens and different applications."

Network management platforms such as OpenView and IBM's SystemView do provide single-console access to different vendors' management applications. However, users need to be trained to use each application's unique interface, Pansini points out. Network managers generally get adept at one application, which they turn to first when problems crop up. "They may not go to another application that might give them the right information upfront," he says.

JOHN FLECK

IU is using a Web reporting tool that is more versatile than OpenView, says Steve Wallace, manager of network operations at University Computing Services.

Toys R Us also wants to set up a Web server as a repository for information collected from various management applications, Pansini says. It ultimately wants users to correlate and analyze information collected across different network domains. The intranet has yet to provide the cross-vendor standards needed to do this. However, a couple of standards consortiums are addressing the problem from different angles (see story below).

A number of other companies have the same idea. GTE Data Services, for example, has for several years stored key system error messages on Web pages, says Kevin Rea, systems supervisor for the GTE Corp. operations support organization in Tampa, Fla.

Rea's group is in the process of creating hypertext links between its repository and Boole & Babbage, Inc.'s Command Post, which consolidates event messages from15 different management monitors onto a single console, Rea says. A Command Post facility lets users click on an error message and call up a record of information, such as descriptions of similar events, relevant to that message. Rea's group wanted a Web interface so Command Post could automatically call up relevant information on pre-existing Web pages.

Rather than rekey management information from the Web pages in to Command Post, Rea's group is setting up hotlinks between GTE's repository and the Boole & Babbage platform, Rea says. "Plus," he adds, "we can set up hypertext links into heavy-duty product documents on Web servers."

Ahead of the crowd

Some companies have moved beyond browsing existing management platforms to building their own intranet-based management applications.

Indiana University (IU) at Bloomington is exploiting Perl, an intranet scripting language, to create an ad hoc network event reporting tool that can be far more versatile than OpenView, says Steve Wallace, manager of network operations for IU's University Computing Services.

For example, network managers wanted to view which routers were exceeding error and collision rate thresholds. OpenView did not deliver this type of report or the tools to easily generate it, Wallace reports.

Wallace's group solved the problem with just a few hundred lines of Perl code. The resulting scripts interface with a shareware Web-based SNMP MIB library developed by the Delft University of Technology in the Netherlands.

"Perl is a flexible language: It's easy to collect and format and sort data so it can be displayed on a Web screen," Wallace says. "And it's popular, so things like an SNMP library are easy to find."

The university also uses a utility that presents the data as ASCII graphics, Wallace says. "It would be just as easy to [present the data] in other graphical formats, but we used this so users can get at it either from a browser" or a regular ASCII terminal, he explains.

Companies also are building intranet applications that monitor network devices directly, using embedded Web links provided by leading network system vendors such as Cisco and UB Networks, Inc.

IU's IT department, for example, developed Web pages with hotlinks to Web servers Cisco built into its routers, Wallace says. The hyperlinks let network managers automatically call up a router's status from the internal Web server, he explains.

Wallace's group also has published internal Web pages on basic network asset and topology information, such as which subnets are in which buildings or how to determine a NetWare address for a particular subnet, he reports. "It's

See Management, *page 38*

MANAGEMENT MANEUVERS

Eighteen months ago, Turner Broadcasting System, Inc.'s software services group asked all major network and systems management vendors for a Web interface so it could open management data to all users. It heard a lot of laughter, recalls Charles Hebert, a senior technology manager at the company.

If only the company had waited a year. By now, virtually all leading network and systems management vendors have announced a Web browser interface.

These days, network managers even entertain hopes the intranet will provide what vendors have promised for years: de facto standards for client interaction with management applications and information repositories.

To do this, though, intranet and network management vendors need to go a long way beyond browser interfaces. For one thing, HTML-based clients can do little more than download and view pregenerated management reports as Web pages. Users want more real-time, two-way interaction with managed systems through the intranet, says John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

Furthermore, a common management graphical user interface only addresses one piece of the puzzle. "Firing up the browser to get recent network statistics is fine," McConnell says, "but how long will it take to integrate [that information] across network management environments?"

Users like Paul Pansini, manager of network systems at Toys R Us, Inc., express a desire to collect, analyze and correlate information from different network domains.

In order to provide this capability, vendors need to agree on standardized ways to represent and exchange managed objects, such as network devices and systems, router ports and network functions. Hewlett-Packard Co. and other vendors have been long promising this.

Vendors began working on full-function intranet-based management standards last spring. The effort has fragmented — unfortunate but typical — into rival camps: the Web-Based Enterprise Management (WBEM) initiative dominated by Microsoft Corp. and the Java Management API (JMAPI) initiative led by SunSoft, Inc. Both efforts have broad (and, to a large extent, overlapping) industry support.

THOMAS ENGLAND

Most OpenView users can get what they need via the Web, says Charles Hebert, a senior technology manager at Turner Broadcasting.

The good news is that in October both of the above camps, as well as major players like HP and IBM/Tivoli, began work on standardized, intranet-based managed object definitions under the auspices of the Desktop Management Task Force. The standard will be based on the HyperMedia Management Schema component of WBEM, as well as pieces of JMAPI, according to Mike Gionfriddo, architect for SunSoft's JMAPI effort.

The bad news is that common object definitions will not guarantee portability or interoperability across different vendors' information repositories, Gionfriddo says. "Each vendor will have its own way of storing and accessing objects in an information repository," he explains.

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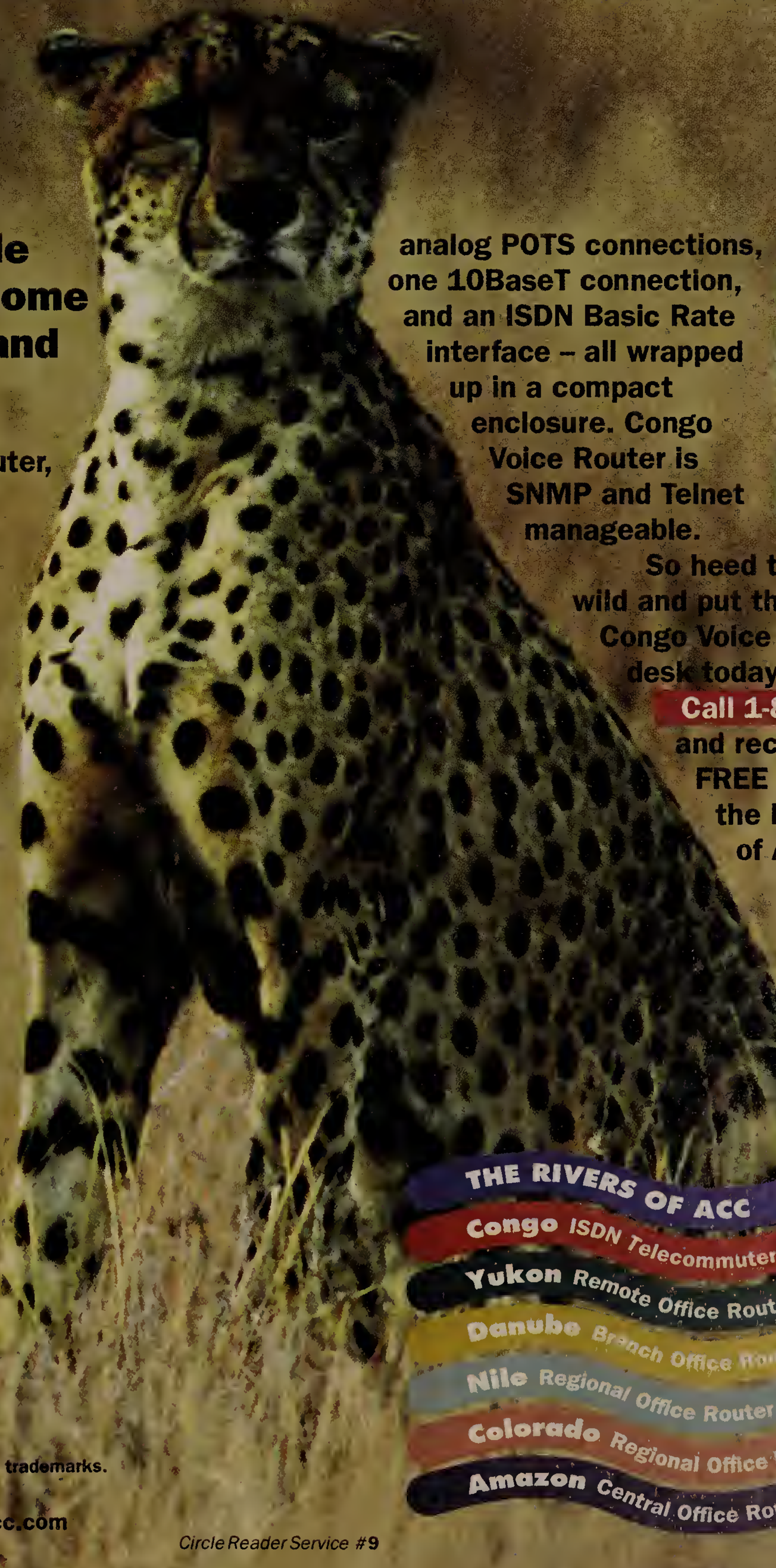


Management, *continued from page 36*

used both by network management folks and users configuring the Novell networks," he says.

IU is not managing its Novell installations via the Web now, but is thinking about expanding Web management to collecting information from NetWare and Domain Name Service servers, Wallace says.

The intranet does have some limitations as a network management vehicle, many of them HTML-related.

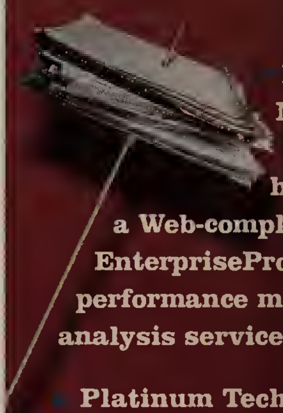
Turner Broadcasting's Hebert complains, for example, that network managers must "blast out a new HTML page every time they want to update one field, so we now have to rebuild some pages every minute or so." To remedy this, the IT group is incorporating Java to enable Web browser users to update records interactively, Hebert says.

Hebert also says he'd like to see more tools for propagating changes efficiently across multiple Web servers. Right now, the broadcasting company keeps all management data on a single Web server. "If the network between here and Hong Kong goes down, people in Hong Kong lose access to [management] information," Hebert says.

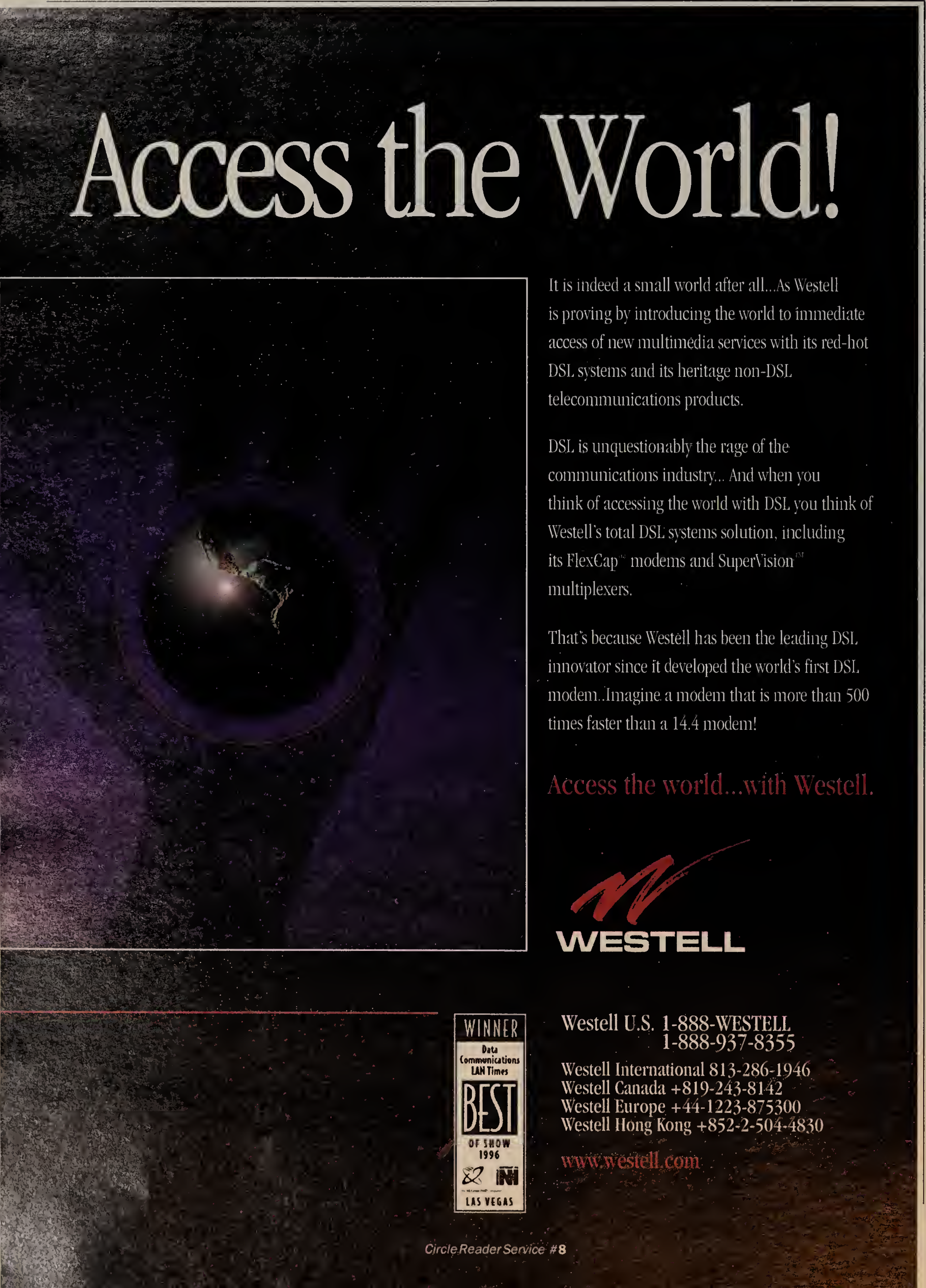
IT is looking to develop a way for each region to manage itself via a local Web server and send information up to the master server in Atlanta. However, IT plans to rely on OpenView "to ensure the data is being updated correctly" across the servers, Hebert admits. "The Web won't replace OpenView." ⊜

WEBIZED MANAGEMENT

Some promising intranet-based management developments include:



- **International Network Services (ins.com) has announced a Web-compliant version of EnterprisePro, a network performance monitoring and analysis service.**
- **Platinum Technology, Inc. has promised Web browser support for its management tools that measure transaction rates and performance of networks, databases and servers.**
- **ServiceSoft Corp. (servicesoft.com) has unveiled Web Advisor, a tool that lets intranet users build and access a knowledge base for analyzing and solving common network and software problems.**
- **Epilogue Technology Corp. (epilogue.com) and SNMP Research International, Inc. (snmp.com) have announced tools that let vendors provide Web browser access to SNMP-enabled management capabilities already embedded in their network devices.**
- **Carrier LDDS WorldCom (wcom.com) has introduced a Web browser link that lets users monitor performance on their data and voice wide-area circuits.**
- **Microsoft Corp. (microsoft.com) has announced that users will be able to browse the trees of its upcoming enterprise directory via the Web browser directly, or use the browser to access the upcoming Slate, a graphical user interface-based console for administering the directory.** ⊜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Circle Reader Service #8

Mission Intranet

Knight-Ridder Information departments embrace the intranet.

TAKING HOLD

Marck Shipley (bottom right) and his content masters: Sandra Watkins, Lori Cruz Spray and Nick Marquart.

DAVID POWERS

PROJECT IntraNet

Part 2 of a series.

This is the second in a series of articles following the development of an intranet at Knight-Ridder Information, Inc., a 1,000-employee information services firm in Mountain View, Calif. In this installment, we describe how departments have crafted sites to suit their needs and the challenges they face.

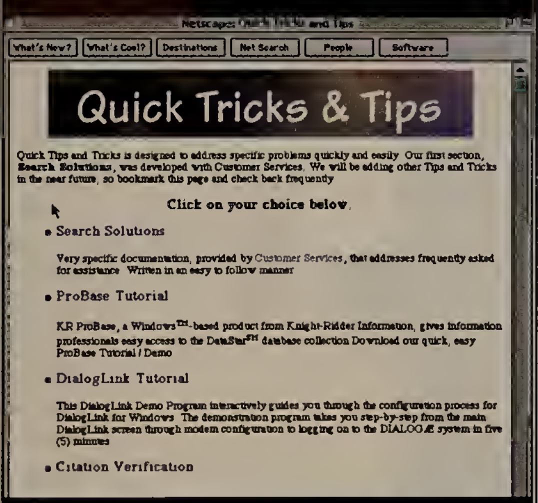
Once an intranet seed is planted, it's hard to stop the growth, even if the gardener is distracted with other tasks.

At Knight-Ridder Information, Inc., intranet architect Marck Shipley was recently promoted from vice president to senior vice president of technology. The good news for the company's fledgling intranet is he can more readily promote its growth in his new post; the bad news is he's too busy with new administrative duties to tend to the intranet garden first hand.

But the project has taken root and is sprouting on its own. Knight-Ridder Information's IT department put up an intranet home page in late summer to connect all the various departments that were experimenting with using Web technology inside the firewall. IT put up its own Web site too and Webified a few key applications for demonstration purposes. (See "Mission Intranet" in the October issue of IntraNet, page 35).

But already Web pages are many and skeptics few. In September, Shipley was readying his pitch to senior management on funding development of a corporate intranet. But management decided the formal presentation wasn't necessary — enough groups and departments had enthusiastically put resources on intranet sites to make the idea's worth apparent.

ST&D PAGE Knight-Ridder Information



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Click on your choice below.

- Search Solutions

  Very specific documentation, provided by Customer Services, that addresses frequently asked for assistance. Written in an easy to follow manner

- ProBase Tutorial

  KR ProBase, a Windows™-based product from Knight-Ridder Information, gives information professionals easy access to the DataStar℠ database collection. Download our quick, easy ProBase Tutorial / Demo

- DialogLink Tutorial

  This DialogLink Demo Program interactively guides you through the configuration process for DialogLink for Windows. The demonstration program takes you step-by-step from the main DialogLink screen through modem configuration to logging on to the DIALOG® system in five (5) minutes

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The ST&D department provides quick access to solutions for common problems.

"It has not been a difficult sell," Shipley says. Knight-Ridder Information is increasingly orienting its business — providing information — toward the World-Wide Web. This has helped raise awareness of Web technology across the board.

Shipley expects some groups will embrace Web sites faster than others (he has had to run demos for a few doubtful managers). But enough materials are online that Shipley expects to deploy browsers to all 1,000 employees by the end of the year. The company has licensed Netscape Communications Corp.'s Navigator browser, although the handful of users running Windows 95 can browse with Microsoft Corp.'s Internet Explorer.

Shipley had hoped to make corporatewide access available in October but is behind schedule. His old and new job duties (by mid-November, he had not yet filled his former post) and the birth of some new ideas about how to manage the intranet slowed the process, Shipley says.

The growing intranet is changing some jobs and creating others. Shipley says he'll hire an intranet Webmaster and already has assigned contractors and IT staff to specific construction tasks, such as designing templates and report forms. He is also building a corps of content masters, about two dozen of whom will receive training in HTML, template use and related topics this month.

Establishing content masters will also take some time, though; some of those employees need their computer systems updated to Windows 95 so they can use Microsoft's FrontPage Web page design software.

Many departments already have designated de facto content masters and are putting existing resources online and developing new pools of information designed for Web access. Noteworthy examples of the intranet's continued growth are found in the Strategic Training & Development (ST&D), Quality Assurance (QA) and Customer Service departments.

Browsing for support

Technical support staffers always need to answer questions quickly, so Web pages bristling with links to technical resources sounded like an ideal knowledge base to Lori Cruz Spray, technical support specialist. She architected an early internal Web site for the Customer Services Department.

Last spring, the tech support staff started storing technical references and documentation in HTML format on a shared server and reading them with a browser. During the summer, Cruz Spray designed a Web page to allow links and better searching and moved the respository to the IT department's Web

See Knight-Ridder, *page 40*

Knight-Ridder, *continued from page 39*

server. She also built links to other resources, such as vendor's Internet sites.

The biggest challenge is keeping the information current, but that is crucial because up-to-date data is what keeps the site valuable, Cruz Spray notes. Staffers joke that Web support could make the need for human technical support obsolete, but they'll still get the really tough questions.

Sometimes putting existing materials on Web pages creates something greater than the sum of the parts.

In Knight-Ridder Information's ST&D Department, Web technology has inspired the staff to create new programs. "We're concerned about alternative methods of delivering training materials," says Sandra Watkins, an instructional designer who joined the company in June as an online resources designer and has crafted the ST&D portion of the corporate intranet. But the project goes beyond simple Web pages.

For example, Information Management Consultant Ron Rodrigues recorded a series of videos featuring tips and tutorials for field representatives. Watkins edited the videos, packaged them with related document resources and will put them on the Web site as part of a new Expert Insights program.

"It's exciting," Watkins says. "The more we do, the more new ideas we generate."

Building welcome links

A broad diversity of documents helps make a Web site valuable, but also tougher to build. The biggest challenge for Nick Marquart, director of quality assurance, has been converting a myriad of document formats to HTML for posting on the Quality Assurance pages.

QA, which helps plan and conduct projects, built one of the company's first intranet Web sites some 18 months ago. When Shipley created a corporate internal home page, QA was one of the first links. The department still maintains a separate Web server but will move to the IT department's Windows NT intranet server, as IT takes responsibility for all the intranet equipment.

"We have people working on so many different platforms, a Web site was the easiest way I could see to make resources available to greatest number of people," Marquart says.

But he still has trouble Webifying all documents. Microsoft's family of Internet Assistants, which translate the various MS Office document formats to HTML, don't handle illustrations, tables or tables of contents satisfactorily, Marquart says.

Next online

Shipley wants to nurture this departmental initiative. He gives groups a great deal of freedom to set up the Web site that works for them; he calls the internal home page a "card catalog" to point to what is out there.

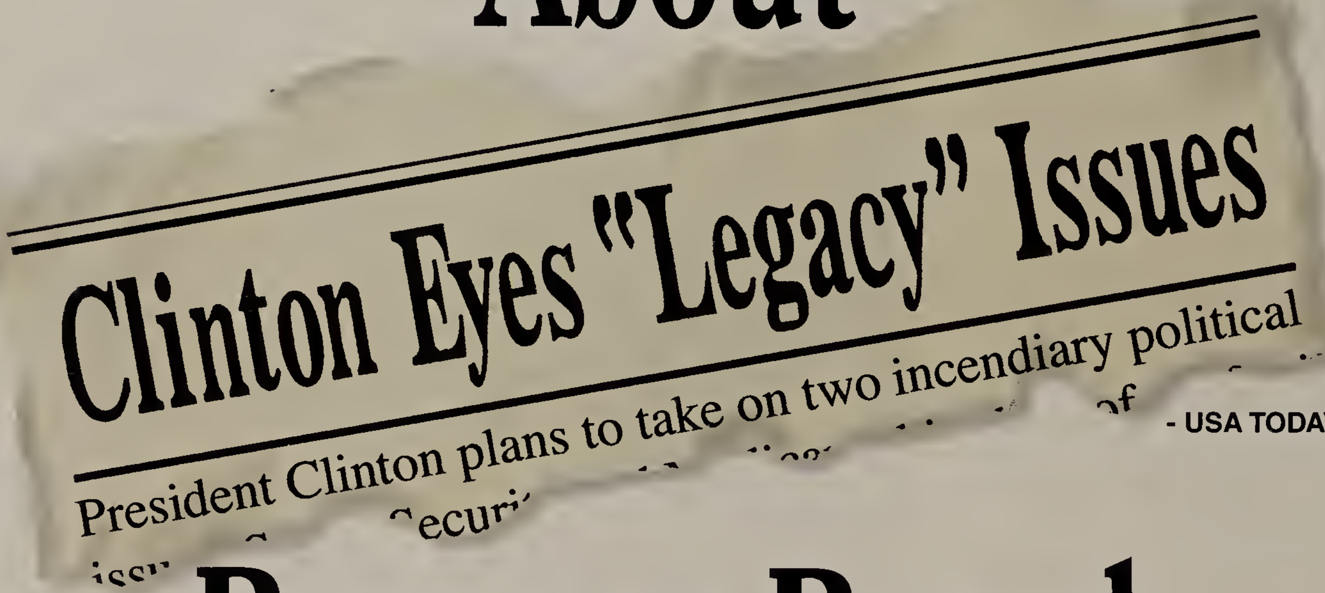
"We're trying lots of different things. There are no hard-and-fast rules to follow," Shipley says.

The next priorities include tying in existing resources by building Perl connections to the company's several Oracle Corp. SQL databases and linking to Notes servers.

Shipley continues to modify the intranet and is wary of anything that limits ideas about how to use the technology.

"We're not trying to impose some structure that restricts people from being creative and entrepreneurial," he says. "I expect the intranet will continue to grow and even become institutionalized. Instead of creating a document and sending it out through E-mail, we'll create an HTML document and link it up to be available through the Web. I hope it becomes the first place people look for information in the company. It should become part of the environment, like a chair and a desk — something you need to get the job done."

He Must Be Talking About



Clinton Eyes "Legacy" Issues

President Clinton plans to take on two incendiary political

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Browser-Based Mainframe Access

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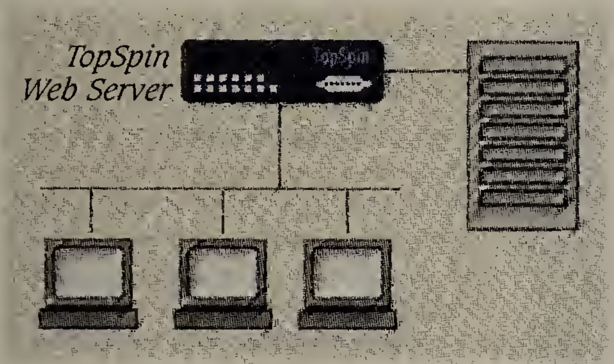

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Circle Reader Service #12

Corporate training departments are discovering the intranet to distribute some smarts, quickly and

BRAIN POWER

BY BETH SCHULTZ

The starship you're commanding has entered the Albuquerque, N.M., airspace. You've been invited to beam down to Sandia National Laboratories, where an ensign has volunteered to take you on a tour of a 20th century office that has been maintained in its original state.

To your horror, you find hazards lurking around every corner — sharp, protruding objects, overloaded shelves, chairs with broken backs and blocked exits. "Ensign," you say, "I'm going to write down a list of these hazards to post on my ship before I go a step further into this death trap! I might lose personnel in a place like this!"

Just then, the ensign jumps in front of you and grabs a live wire jutting out from an overloaded electrical strip to prevent you from touching it. With electric current coursing through his body, he says: "Not to worry. I'm an android; just call maintenance, and they'll do a lockout/tagout."

Welcome to StarTech, one of three courses in Sandia's intranet-based Environment, Safety and Health (ES&H) Awareness training track. This particular module is called "Close Encounters: How to Recognize ES&H Hazards."

Is the role-playing too corny to be taken seriously?

Sandians don't think so, says Elsa Glassman, senior education and training consultant with the company's Corporate Training and Development department. They enjoy the humor-laced program that also has them fighting a fire on a holodeck, dealing with dangers brought

how to use on the cheap.

onboard by alien "Clickons" and coping with a mad scientist.

All the while, they're refreshing their ES&H knowledge and putting it to the test through a series of questions that pop up throughout the course. They have to answer all the questions before they get credit.

Employees especially like this training course compared to the previous alternative: Until two months ago, employees who needed to take the training — meaning everyone, per federal mandate — were herded into an auditorium with hundreds of coworkers. Once there, they listened to someone speak on five different ES&H topics for up to three hours at a sitting.

"The content, the quantity of information and the quality of delivery was inconsistent — instructors would decide not to use a videotape or a handout, or would add their own material or forget some slides," Glassman says. "Some of the information between courses was conflicting, redundant or inadequate, and all of it was dry."

What's more, the old method didn't provide Sandia employees with a way to prove mastery of the material. So even if they knew the presentation inside and out, say, because they'd listened to it for five years running, there was no way to prove it. They still had to sit through a three-hour session in order to meet compliance requirements.

Besides being inefficient, the former training method was expensive. Glassman says it cost Sandia $2.5 million annually to bring each of the company's 10,000 employees and contract workers into an auditorium for three hours so they could yawn their way through a dull lecture on ES&H Awareness.

There had to be a better way.

Turning to Sandia's internal Web – which the company has been running since 1994 — was a natural choice, says Richard Graham, a member of the technical staff at Sandia, and leader of the team responsible for putting the training module online.

Glassman served as the instructional designer and content expert on the team, which also comprised a writer with HTML experience, a graphic designer and a systems designer who happened to be, not coincidentally, a JavaScript programmer. The team had $50,000 with which to work.

The team used the intranet to make lemonade, Glassman says. "We had five pretty sour lemons separately. We combined them, sweetened them by putting them on the Web and adding some entertainment and personal value. We made training more palatable."

Despite the widespread universe of avowed Trekkies, Graham and his team recognized that not every Sandian would find this type of presentation appealing. So the company also created "Testout" and "Just the Facts" modules for the same material. Employees can choose which version of the course to take.

DAVID POWERS

Sun anticipates saving an average of $2,200 each time it can refer a salesperson to an intranet-based training course rather than making that person fly to corporate headquarters for live instruction, says Jerry Neece, Sun's training programs manager.

Using these modules, the team was able to cut the average training session from about three hours to 30 minutes and will save Sandia more than $2 million yearly, Glassman says.

No more travel

Other training departments venturing onto the corporate Web are finding equally compelling financial reasons for their forays.

Silicon Graphics, Inc., for example, is reducing the cost of training its sales staff on workstation products by an estimated $150 per person, according to a study recently conducted by Claremont Technology Group, Inc., a client/server and Internet systems integrator in Basking Ridge, N.J.

This savings translates into $16,500 per month. Claremont expects that monthly figure to grow to $30,000 as the Mountain View, Calif., computer maker trains new employees on its workstation line.

Sun Microsystems, Inc. anticipates saving $2,200 each time it can refer a sales person or systems engineer to an intranet-based training course rather than flying them to headquarters for live instruction. "If I can save one trip a year to headquarters for a [systems engineer], I can buy a Web server and a video server for every branch location with more than five people," says Jerry Neece, training programs manager at Sun.

And like the Sandia training designers, Neece and his team have been able to create more appealing programs. Via the Sun Training Access Network (SunTAN), the training department delivers self-paced, custom-tailored, interactive courseware for the sales team and system engineers.

This differs from the Sun University programs of old, in which a group of students received an hour of instructor-led training for each subject in a mind-numbing, week-long agenda delivered in Mountain View. This format was pretty tough on a trainee's attention span, and negatively impacted retention rate, Neece says.

"There's no doubt: From a [return-on-investment] model, training over the intranet is very easy to cost-justify," says Bruce Hawkins, vice president of sales at StorNet, Inc., a West Chester, Pa., integrator that specializes in network-based video solutions. "Plus the impact on customers is significant — retention rate is higher, it's a better use of their time, they can train at their own pace and at their own level."

See Brain Power, *page 44*

Brain Power, *continued from page 43*

This assessment mirrors what employees are experiencing. If for no other reason, intranet-based training gets high marks because it gives users control over how and when they learn.

Our audience wants the training to come to them, where and when they want it, says Joe Harrell, training manager at Cisco Systems, Inc., in San Jose, Calif.

The training department's constituency — salespeople, resellers and corporate partners who need to get up to speed on new products — can't afford to be away from their jobs, Harrell says. "Our plan is to use as much media- and Web-based training as we can."

Relation to CD-ROM

The intranet often supplants — or at least supplements — the interactive, multimedia training companies have delivered via CD-ROM.

In a recent survey, CBT Solutions, a Hingham, Mass., consulting firm, asked more than 1,000 computer-based training providers about their plans for delivering their material over a network. Of the 1,024 respondents, 60% said they either already do or plan to offer training via the Internet or an intranet.

StorNet's Hawkins says he's witnessing the migration of content from CD-ROMs to Web servers. "The intranet itself is not a cake-walk, but we're seeing more and more activity in this environment."

Jay Moss, a senior producer at Chevron Corp's Business Products and Services Multimedia Center in San Francisco, says he sees this trend within the training industry. Chevron still delivers 90% of its interactive training programs on CD-ROM, but the center now offers training managers an intranet option.

Internal surveys show employees would like the ability to receive training at their desktops, and training managers have indicated they'd prefer an intranet delivery system as opposed to CD-ROM, Moss says.

STAN BAROUH

Intranet-based training empowers users with the ability to craft the learning experience themselves, says Dale Coyner, comic book aficiando and project manager at Ernst & Young.

"Companies are moving this way because in the long term, it's much more cost-effective to deliver training over the intranet than to equip all computers with CD-ROM drives," Moss says.

The Multimedia Center hasn't had any formal takers on its intranet offer, but Moss says he expects to begin such projects next quarter. He expects the training programs to include text, graphics, short audio clips and Java-based animations and to incorporate testing.

"We'd construct the training program, as much as we can, to resemble a game. It's critical to keep people's interest high," Moss says.

> *"So much of the content [CD-ROM] was hard-coded, it was getting difficult to make revisions to meet the changing business climate."*

Training program developers have favored CD-ROM distribution because it allows them to create rich media content, including video and sophisticated audio. But keeping CD-ROM programs up to date is a major shortcoming, says Dale Coyner, project manager at Ernst & Young LLP in Vienna, Va.

"We had been issuing CD-ROMs on a quarterly basis. So much of the content was hard-coded, it was getting difficult to make revisions to meet the changing business climate," Coyner explains. What's more, he adds, users were overloaded by the volume of information stored on the discs.

The consulting organization now uses an intranet-based training model, and in the process has empowered its users with the ability to craft the learning experience themselves.

The training department has created an interactive continuous learning site where people from a particular community of practice can share their insights on what's happening in their industry. The training group helps shape the discussions, asks questions to get the conversations going and adds collateral material to the site, Coyner says.

"This gives people a much better feeling for the issues companies are facing in the industries we serve," Coyner adds. "We help them become thought-leaders."

Pointing to Ernst & Young's heritage as a big user of Lotus Development Corp.'s groupware products, the continuous learning site is actually a hybrid application that's part HTML and part Notes. "There are some things we simply can't do in Notes that we farm out to the Web," Coyner says.

For example, the company uses browser plug-ins such as Real Audio and Live Chat, a real-time, text-based conferencing program. But supplemental text, audio and graphics files will typically reside in a Notes database. Of course, this is transparent to the intranet trainee, who simply clicks on a hyperlink to get the information.

Infrastructure issues

Coyner says he's kept the network police at bay by relying on the Notes infrastructure, and by keeping the audio clips to a minimum and storing them in their own database. "When someone pulls that stuff across the network, they get the text and graphics initially. If they want the audio, that comes separately," Coyner says.

Sometimes, Coyner adds, users can't hear the audio clips because their PCs aren't equipped for sound. The standard desktop set comprises Microsoft Corp.'s Windows 95 operating system, with Notes 4.0 and Netscape Communications Corp.'s Navigator 2.0 browser.

"It's helped a lot to know exactly what users have on their desktops, but the continuing issue is that some of our audience is audio-equipped and some isn't," Coyner says. "Audio is an essential component of making training interesting and compelling, so we'll continue to use audio clips, but make sure people who can't hear them aren't missing out."

Desktop and network resources can be the big gotchas for training managers trying to put courses on an intranet. While a big infrastructure company like Cisco may have bandwidth a plenty, the average company can't support fancy interactive, audio- and video-heavy programs at the desktop or across the intranet.

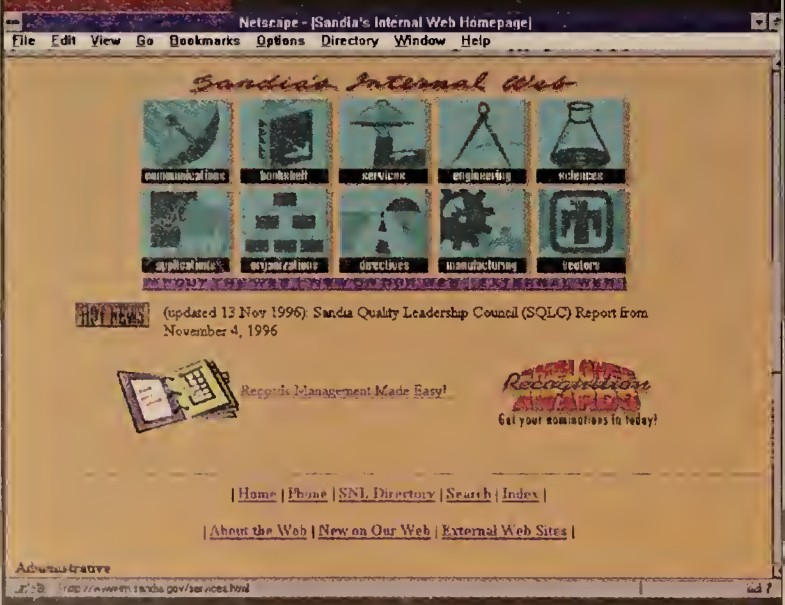
"We thought about video and audio, but the bottom line is that too many people don't have what it takes," says Sandia's Graham. "The training has to be delivered to all Sandians, so we ruled out certain functionalities."

Chevron made a similar decision. "There'll be no video whatsoever," says Moss of what he expects of early intranet-based training programs. "Compression and bandwidth issues prevent us from incorporating video content."

That means if the Multimedia Center needs to transform a training CD-ROM for the Web, it will have to extract all the video from it and use still frames instead, Moss says. It might have to reduce audio content as well, he adds.

Without video at their disposal, producers might rely on Java applets to

HOME PAGE Sandia National Labs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organizations
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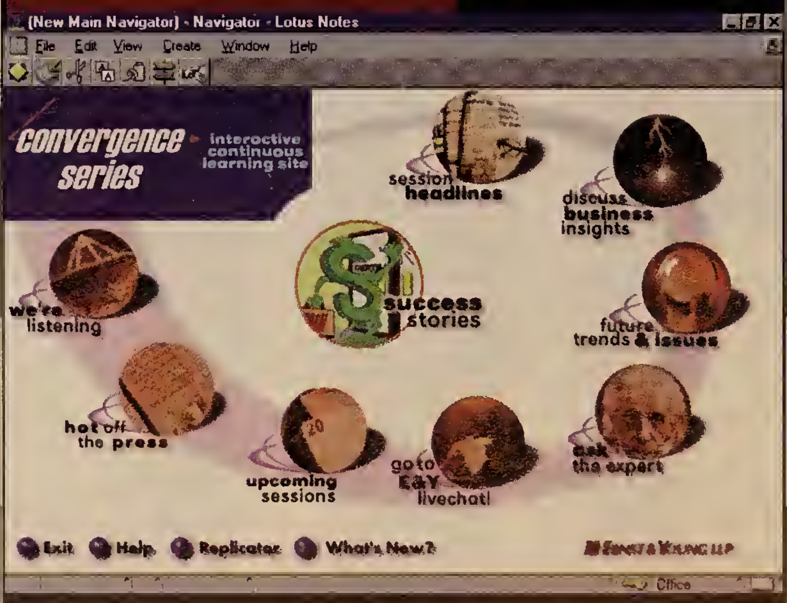
Administrative

(updated 13 Nov 1996): Sandia Quality Leadership Council (SQLC) Report from November 4, 1996

From the corporate home page, Sandia employees can get to online training programs by clicking on Services.

CONTINUOUS LEARNING Ernst & Young



People within a community of practice can share their insights on industry events at this interactive site.

TOOLS OF THE TRADE

Multimedia authoring packages are standard fare for training managers developing courseware for the intranet.

When it comes to supporting an intranet initiative, training managers don't have to stray too far from the tools they already know.

If corporate trainers have been developing computer-based courseware on their own, chances are the tools they've used already have been enhanced for use on a Web. Likewise, if they've been buying training programs, that courseware probably has been updated for intranet use.

By the end of this month, for example, courseware developer Knowledge Communication, Inc. will have intranet-enabled programs on interviewing skills, how to conduct employee reviews and how to prevent sexual harassment. That means the company has taken existing computer-based modules, and stripped out a lot of the audio and video, says Clint Everton, president of the firm.

EDWARD CALDWELL

Producers at Chevron's Multimedia Center will strip out video and audio content when transferring training programs from CD-ROM to the intranet. The producers are (left to right): Susan Hennigh, Ian Day, Wendy Szeto-Lee, Jay Moss, Jacqueline Jones, Gary Laws and Ron Williams.

Rather than watching video responses, for example, students will see graphics and read text bubbles, Everton says. "At this point, intranet-based training is not nearly as exciting as CD-ROM multimedia training, but you have to get rid of the bandwidth hogs."

Global Knowledge Network, a training company specializing in IT programs, purposefully has designed its courses to run "comfortably" over a 28.8K bit/sec modem connection, says Peter Leonard, program director for online distance learning at the company (gknnet.com).

Before engineering a course for intranet delivery, Leonard adds, designers would analyze the network topology and the size of the pipes available. "Some intranets have switched Ethernet and ATM backbones, in which case we can deliver full video on demand to the desktop. But that's not the norm," he says. "Normal is Ethernet linked by a low-bandwidth WAN."

Getting programs created with a multimedia authoring tool to run over a 28.8K bit/sec connection requires some forethought, says David Lasner, senior director of multimedia products management at Macromedia, Inc. (macromedia.com).

"On an intranet, we recommend ISDN or higher, since that's optimal for streaming media," Lasner says. "You lose the ability to do high-density streaming over low bandwidth."

Macromedia and competitors provide, or plan to support streaming audio and video technology in their products to make them more appealing to developers working on intranet courses. (For information on streaming technology, see Handbook, page 10.)

Macromedia, for instance, uses its Shockwave technology to compress and stream sound, graphics and animation content put together with its Authorware authoring software. Trainees will simply need a Shockwave player, downloadable free off the Web, for viewing the program.

Vxtreme, Inc. uses a proprietary algorithm in its Web Theater products that offers 500-to-1 compression over 28.8K bit/sec modem connections, says Sharon Wong, director of product management at the company (vxtreme.com).

Authoring software vendors are making their products attractive to intranet builders in other ways too. From within RadMedia, Inc.'s PowerMedia tool, for instance, developers can go out onto the intranet (or Internet), find an appropriate image, grab it and put it in the courseware. "The Web becomes your file cabinet," says Miles Walsh, vice president of marketing at the company (radmedia.com).

The idea, authorware vendors say, is to let the subject matter experts guide the process. "We let the trainers create the instruction for the intranet. They don't have to know anything about computers or programming," Walsh says.

liven things up a bit, Moss says. An animation sequence, for instance, could help illustrate a particular point during a training session.

That's an approach with which the Sandia team is familiar. It relies heavily on Common Gateway Interface (CGI) scripting to add some spunk to the training courses, Graham says. Through scripts, for example, the server reads an employee's sign-in information, picks up his or her name and uses it to personalize the training session. Upon logging into StarTech, a mere technical staffer becomes a ranking star fleet captain — Captain Graham, for instance.

From the employee's Social Security number, the program delivers location-specific ES&H instructions. Procedures in New Mexico, for example, might be different from those mandated for California. So a Sandian working in Albuquerque would see different guidelines, including phone numbers to call, than someone at one of the company's California sites.

For employees who come into the site via a Navigator 3.0 browser, the team uses JavaScript to deliver feedback on the answers they've given to the embedded questions. CGI scripts are used to handle the interplay for users with lesser versions of the browser, Graham says.

Not surprisingly, Sun also plans on using Java to deliver customized training pages. The training development team takes information gathered during the online registration for SunTAN to create profiles for users, Neece says.

"We'll know if someone is coming in to the site using a 14.4K-bit/sec modem from Germany. We could then ship German content and take away all the extraneous stuff," Neece says.

Like Chevron, Sandia and others, Sun has a bandwidth problem with which to contend, Neece says. "The Web has gotten too slow for training."

But that didn't stop Neece from creating video-based courses for the intranet. It simply forced him to design a program, called SunWeb, which doesn't involve sending video and audio files across the intranet. (For a full story on SunWeb, see the August issue of *IntraNet*, page 31.)

"All I send across the network is HTML. The rich media types are served locally," Neece explains. "In training, latency is important. You have to keep people engaged. You can't expect them to wait a half an hour for something to load."

Plus, he says, this architecture makes the WAN managers happy. "They'd rather have an order coming across the wire than a 150M-byte MPEG training file."

Makers of the multimedia authoring tools used to write training programs are also working on ways to better prepare the output of their products for delivery over the intranet (see story above).

With Vxtreme, Inc.'s tool, for instance, you can do 10 to 15 frames per second over a 28.8K bit/sec line. This is perfectly adequate for training, Neece says.

However, the size of the video window will vary. If you're a remote user connected to the intranet over a 28.8K-bit/sec line, you'll see the video in a 160 pixel by 120 pixel window. If you're directly attached to the intranet, the window might be as large as 320 pixels by 240 pixels, which, at about one-quarter of the screen, leaves plenty of room for other material, says Sharon Wong, director of product management at Vxtreme.

Whether they create text-only or full multimedia courses, training managers are excited about delivering their programs over the Web. The Web forces training developers to rethink their strategies, Neece says.

"I have to step back and think: It's not important that people remember the clock speed of a Netra server. They can look it up. We have to condition them to go to certain URLs to get the information they need," Neece explains. "What we need to teach them is how to find information, not how to memorize it." ⊜

As you're planning your applicaitons and organizing your information, don't think of your intranet and your presence on the Internet as separate things. ... Obviously, there will always be information that you won't want outside your enter-

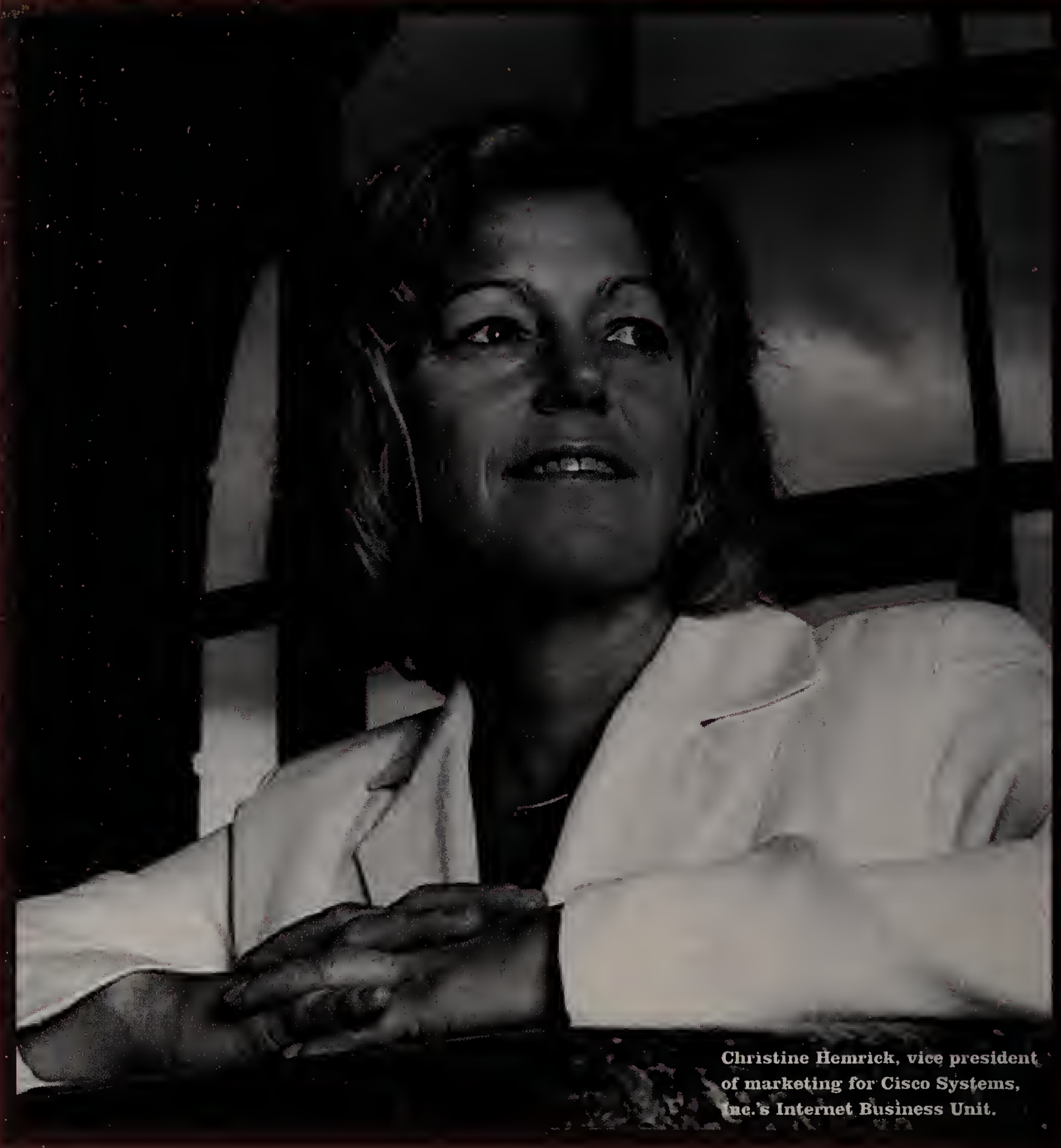
INTRAVIEW

Q&A

A better foundation

If there is any company that understands the ins and outs of network infrastructure, it's Cisco Systems, Inc. Cisco dominates corporate networks, its routers are at the very heart of the Internet, and the company is now pushing into the carrier market with its acquisition of StrataCom, Inc.

The big issue for Cisco is: How do intranets change the game for corporate users? Editor in Chief John Gallant posed that question, as well as others about the strength of the Internet, to Christine Hemrick, vice president of marketing for Cisco's Internet Business Unit.



Christine Hemrick, vice president of marketing for Cisco Systems, Inc.'s Internet Business Unit.

CINDY CHARLES

Hemrick knows the technology inside and out, having served as marketing director for Cisco's Internetwork Operating System software and as district manager for broadband data services at Bellcore.

How is Cisco an intranet company?

Cisco was one of the first companies to understand the potential of the intranet and one of the first to actually begin an aggressive intranet implementation. We've gone beyond just posting information for reading with a browser. Today, we use Web technology internally for almost everything: managing product development, tracking and updating customer service cases, and auditing department expenses.

We're developing online expense report filing. We've linked our intranet systems with the 'big I' Internet systems our customers access, so customers can do things like check the status of their product orders, enter new orders and update their problem cases.

Our intranet is absolutely critical to ensuring that our processes and people scale with the tremendous growth rate of our business.

By virtue of being active users of intranet and Internet applications, we've been able to spot some interesting product opportunities. The ideas for many of our Internet Business Unit products were stimulated through our experiences. Products like the Cisco LocalDirector, Cisco Private Internet Exchange Firewall and IPeXchange NetWare-to-IP gateways all solve issues that arise when you start taking the Internet and intranets seriously.

How will the average company's network infrastructure have to change to accommodate intranets?

The first part of the answer is obvious: Buy as much bandwidth as you can afford both internally on the campus and in your connection to the Internet. Put in LAN switching, invest in Fast Ethernet, plan for Gigabit Ethernet or ATM as your budget and technology strategy allow.

You have to do this because everything — your product documentation, marketing material, your expense reporting systems, your order processing systems, your travel planning, everything — is going to go up on either your intranet, your Internet or both. It will all be graphical, and everybody in the company will become your user — not just the knowledge workers, but anybody who has to file an insurance claim, register for a training class or fill in a timesheet.

The second part is architectural: As you're planning your applications and organizing your information, don't think of your intranet and your presence on the Internet as separate things. Obviously, there will always be information that you won't want to have available to anyone outside your enterprise. But if you build the proper architecture and adequate security into your applications and network in the first place, you will have much greater flexibility to take advantage of the productivity that can derive from opening up information to cusprise. But if you build the proper architecture and security into your applications and network in the first place, you will have much greater flexibility to take advantage of the productivity that can derive from opening the intranet.

tomers, suppliers, partners, etc.

I'll use our own intranet as an example again. To allow our customers to check on the shipping status of products they've ordered, as well as place new orders, we have to provide a secure window into some of our internal information. With proper authentication and access controls, a customer can see the same data that a customer service agent would look at. But it costs less and improves customer satisfaction to let the customer do it herself.

If I were a Cisco customer, I'd be concerned whether you could really effectively integrate all these companies and technologies you have acquired.

There's no doubt that this is one of the biggest challenges we face. But our customers have said they want us to provide all the technologies necessary for an end-to-end solution. The network really is a strategic platform, and customers can't afford a piecemeal approach to design and implementation.

We're very much on track with the technology integration — for example, harmonizing ISDN, virtual LAN and ATM technology across our product set. We've very quickly seen the fruits of integration with our StrataCom acquisition in the form of our Tag Switching and Stratm [an ATM chipset] announcements.

Managing these intranets has become a real challenge. What are you doing to get your management tools up to snuff?

The emergence of the browser as a platform-independent GUI to all applications is changing everything, and traditional network management is now being swept up in that paradigm shift. Customers want Web-based management tools, and we will focus on meeting that demand.

They also want more network design and planning tools. We just announced our intended acquisition of Netsys [Technologies, Inc.], a company that in the last two years, in partnership with Cisco, has developed products that are the state of the art in internetwork design and analysis.

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What are some of the misconceptions people have about building an infrastructure to support intranets?

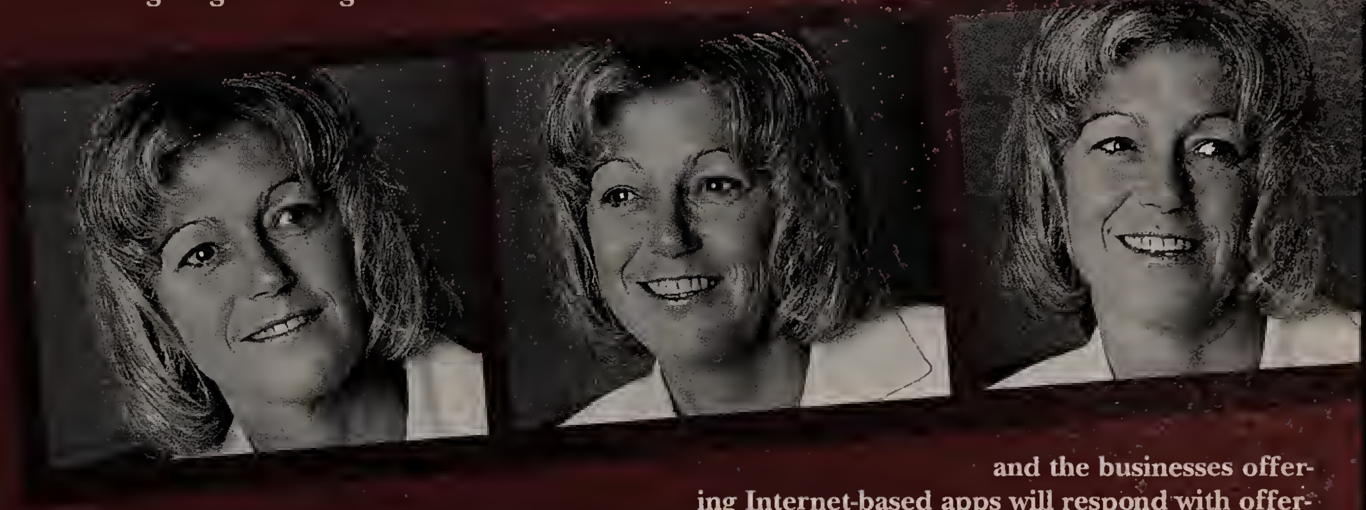
The one that has the greatest impact is underestimating the pace at which browser-based apps can emerge and grow, and assuming that growth can be controlled from a central point.

Remember how LANs became pervasive? The cost of the technology dropped so low that you could buy the cable, the NICs, etc. within a departmental budget. Nobody in MIS had to sign off on it. Most MIS folks remember this period well. And they know that Web-based apps can follow the same trajectory because of the low cost and low complexity of department implementation. Better to plan for the distributed nature of the explosion at the beginning.

Let's shift over to the Internet itself. Is it strong enough to handle our intranet and other business applications?

TCP/IP has proven to be a marvelously scalable and forgiving technology. One of its key design principles was to accommodate the use of widely varying bandwidths within the same internetwork. This developed into a cultural bias in the further development of the protocol that it had to be very flexible and scalable.

We've also innovated to improve the scalability of IP when combined with an ATM infrastructure. This is the technology we call Tag Switching. Tag Switching allows ATM switches to forward packets with the speed of Layer 2 processing but with the intelligence of Layer 3 processing.



An ATM switch will be able to tag switch information while simultaneously doing normal ATM switching. This makes it very easy to integrate Internet traffic with other ATM services a provider may want to support using the same network infrastructure.

There's another aspect of scalability that we need to continue to address, however. Think about the operations challenge the service providers face. For several years now, traffic on the Internet has been growing at about 14% per month. That's per month! No other network, no other utility or public service has ever had to meet demand that grew at that pace.

It's hard to buy equipment, train personnel, figure out a design extension, put in facilities, turn it on, keep track of usage, do all the necessary work fast enough to keep up with this incredible demand.

As a result, it shouldn't be surprising to anyone that we will occasionally see a Mother's Day on the Internet, just as we experience a busy signal sometimes when we all try to call Mother on the second Sunday in May.

As vendors, we need to provide not only products that work in really big and rapidly expanding networks, but also products that are faster to deploy, easier to reconfigure and manage, have better planning tools — in short, we need to focus as much on scaling the operations as we do on scaling the base technology.

Given the explosive growth of Web usage and the emergence of new voice, video and other Internet applications, will the Internet ever be a really stable environment or will it always be struggling to keep up with growth?

There's always a healthy tension, a healthy balancing between the benefits of stability vs. the benefits of immediately exploiting new technology and opportunities.

As the market matures and as customers come to depend on basic Internet service, service providers and the businesses offering Internet-based apps will respond with offerings that will help insulate users from the experimentation that will continue. Going forward, we shouldn't think of the Internet as a monolith. Service providers will increasingly differentiate what they provide, just as the big telephone companies do today.

What advice do you have for companies that are trying to take their intranets across the Internet itself?

There are two situations here. One is simply using the Internet as a replacement for private lines, frame relay or some other wide-area-network service as a lower cost alternative. This is the virtual private network (VPN) scenario. The other situation is opening up applications on the intranet to outsiders, such as suppliers, partners and customers.

Regarding VPNs, most customers have two major concerns: security and performance guarantees. The security issue is easily addressed today with firewall and encryption technology.

Service guarantees are a bigger challenge. Until the service providers really get a quality-of-service architecture in place, many customers will be reluctant to run mission-critical apps over a network that may become congested just at the moment the payroll is due.

However, service providers see a real opportunity here, and they are working seriously to provide the services that will address this market. Even today, it's possible to use the Internet as a virtual private network for non-mission-critical apps such as transporting E-mail to remote locations.

Regarding opening up intranet applications to business customers, I addressed this earlier when I advised to plan for this from the very beginning of the intranet's design. There's no doubt in my mind that this is where a tremendous amount of the leverage of the Internet will come from. ≡

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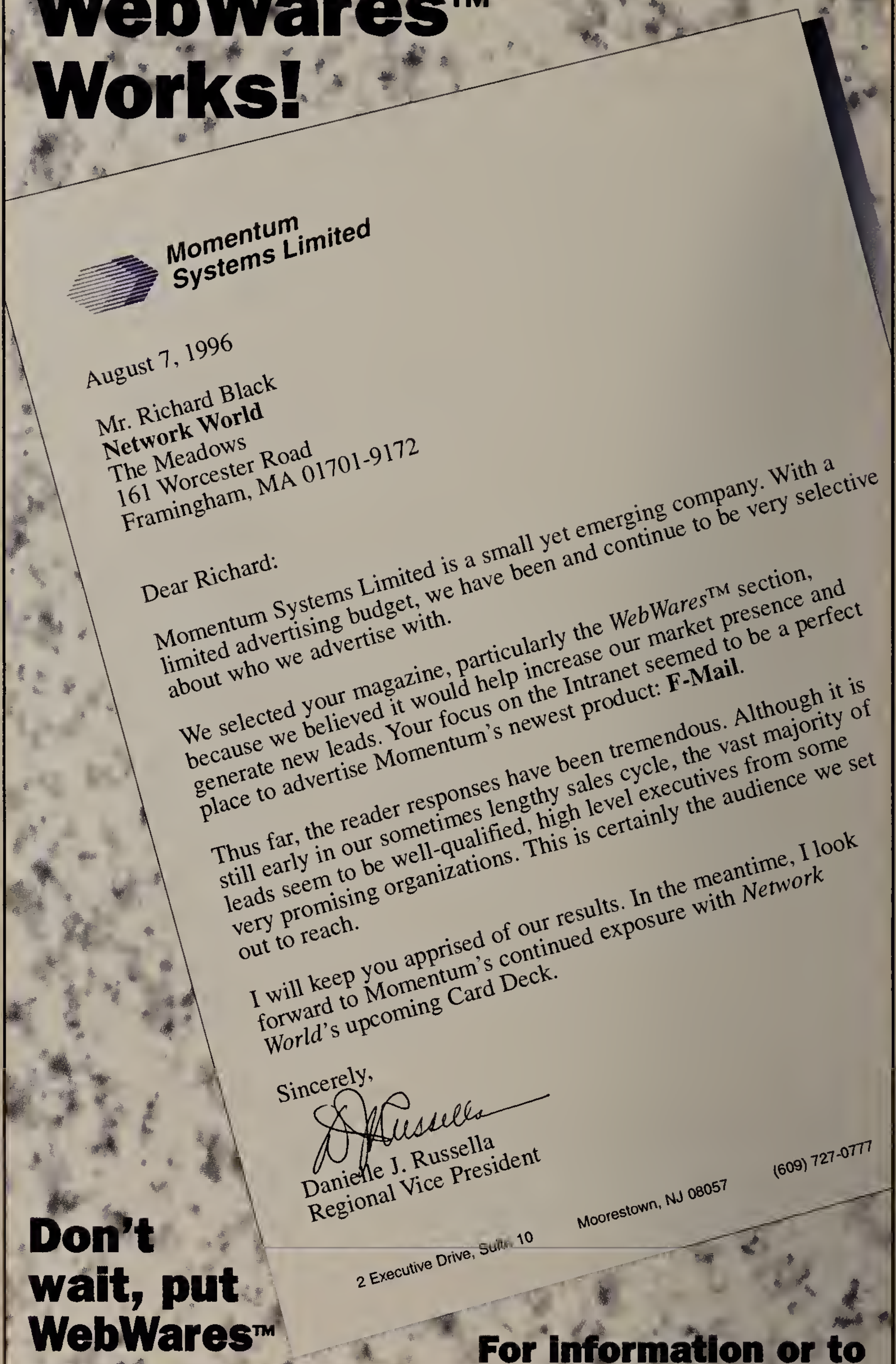

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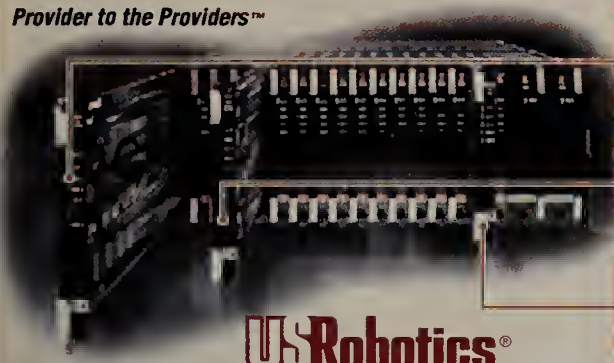

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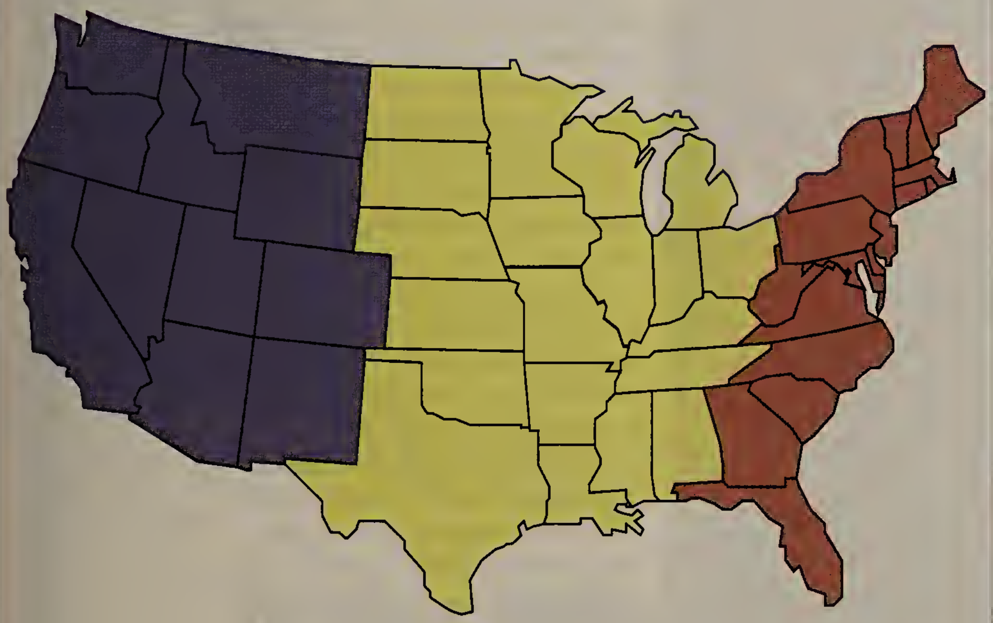

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INTRAVERT • MARK GIBBS

The Neglected Dimension of Network Security:

Who are the Users?

My friend Doug has AIDS. He's had it for 15 years and, thanks for asking, his health is good (actually, he's much fitter than I am).

It's not surprising that many people with AIDS are concerned about their condition becoming public knowledge. Doug is pretty relaxed about the issue, but he feels a certain measure of discretion is the best choice.

It's because I know Doug that a recent news item about a security breach was of even greater interest than it otherwise would have been. What's more, I find its relevance to intranets profound.

The news was reported in Florida on Sept. 18. William B. Calvert III, a health investigator with the state Department of Health and Rehabilitative Services (HRS), is under investigation for improperly using the names of 4,000 HIV-positive and AIDS patients in the Tampa Bay area.

Calvert's job was to collect names as part of a national network tracking AIDS cases. Calvert allegedly had been walking around with a floppy disk containing the data and showing it off in bars. He had also allegedly used the database to screen his dates and to look up names for friends.

Someone anonymously sent the disk, or a copy of it, to the *St. Petersburg Times* and *Tampa Tribune.* The person claims to have gotten the data from Calvert.

State officials call the case the nation's largest security breach of AIDS information, and describe Calvert's actions as a "critical breach of public trust."

Calvert claims the department is using him as a scapegoat to cover up poor security within the HRS system. "The public pays him to protect their information, and they pay us to do the same thing," said an HRS spokesperson quoted by Reuters news service. "He has to meet that standard."

This is an interesting case in that it points to what I see as the neglected dimension of most organizations' network security: Who are the people using the system and for what are they using it?

I suspect that the "critical breach of trust" applies to both Calvert and HRS. You see, I bet HRS security probably is atrocious, which as far as I'm concerned is just as much a breach of trust.

For example, does the database in question have an audit log? If so, does anyone actually look at it and analyze its contents? If these allegations are true, Calvert at some point extracted 40,000 records. This should be obvious in the access log, shouldn't it?

But putting that critical issue aside, we also need to ask how much the HRS knew about Calvert. Did it do a background check on him? If so, did HRS conduct follow-ups?

The relevance to intranets is threefold.

First, with intranets, we're creating environments in which information is intended to flow freely. We want people to use the data and extract more useful and timely information. Second, we want to increase the volume of data to enrich the relevance and context of what we know. Third, we want to cross-link data to look for patterns, relationships and trends.

JOEL NAKAMURA

Yet the fly in the proverbial ointment is the user. Unless we really control the network — particularly the intranet environment — with an iron rod, we have to rely on users to act as befits their roles and responsibilities.

But creating iron rod network management is expensive and difficult. And, as with any formalization of procedures, the entire house of cards can be toppled by one person who won't play the game. I'm sure you're all nodding in agreement, saying to yourselves, "Sure, that makes sense." But are you going to do anything about it?

It's really simple. You identify the sensitive data on your intranet and analyze it. You figure out what that data is worth and what its release or compromise implies for your organization, and then you determine who will have access to the data and who is responsible for its use and integrity.

Then you hire a security firm to do background checks on the employees dealing with the data, and you tell the staff you are going to do so. At least once each year, you perform an update check.

I suspect some of you will say, "But that's an invasion of an employee's privacy." Yep, it may well be, but if that employee is in a position to cause significant damage to your organization, then you and the employee are just going to have to work it out.

And if, as in the case of Calvert and the Florida HRS, it might impact the lives of so many already suffering, you have no excuse not to implement these measures.

Gibbs is editorial advisor for IntraNet. *He can be reached at (800) 622-1108, Ext. 504, or via the Internet at mgibbs@gibbs.com.*

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1996 Finalist MVP PC Computing

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Circle Reader Service ***#10***

Intranets & the 'Net

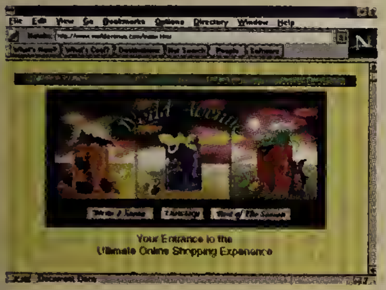
Covering: Internet Technologies and Services
for Collaboration and Electronic Commerce

Briefs

■ **Edify Corp.** *today announced the Web-based Employee Service System, which lets employees access information about their 401(k) plans, insurance benefits, vacation time and other* **human resources data** *made available through links to back-end systems. The Employee Service System will ship early next year. It is priced starting at $50,000.*

Edify: (408) 982-2000.

■ **IBM's** *research division has spotted yet another computer virus,* **Wazzu,** *which works by inserting the word "wazzu" into Microsoft Word documents. IBM said users can spot the virus by checking out IBM's antivirus Web site at www.av.ibm.com to find Web pages that appear to have been created on systems infected by Wazzu.*



In other news, **IBM** *said 14 more retailers have joined its World Avenue Web-based* **shopping mall** *at worldavenue.com. The new additions include Omaha Steaks, Avante jewelry, Fragrance counter, Gottschalk's, Hudson's Bay, Smithfield Hams and Sport Warehouse.*

■ **Microsoft Corp.** *recently posted the second beta of its* **Conference Server,** *which is part of the Microsoft Commercial Internet System —formerly code-named Normandy. Conference Server includes an Internet Chat Server that enables real-time communication and allows customers to incorporate in-frame chats directly into Web pages, and an Internet Locator Server that lets users find other people online for real-time conferencing and collaboration. The final product will ship in the first quarter of 1997.*

Microsoft: (206) 882-8080.

INS packages its Fortune 1,000 security expertise

By Carol Sliwa
Sunnyvale, Calif.

After three years of helping Fortune 1,000 companies devise security strategies, International Network Services (INS) has decided to establish an official consulting program.

The company, based here, had been working on a project-by-project basis with various companies but decided to formalize its service packages, said Jeffrey Kaplan, director of strategic marketing for INS.

The new formalized six-part program focuses on:

- Internet/intranet requirements and policies.
- Perimeter security systems design.
- Firewall implementation.
- Server and workstation security plans.
- Testing and certification.
- Client training.

INS starts at the front end with audits of a network's current security levels. Once those are tested, and faults and weaknesses are identified, INS prescribes technology and business strategies to resolve problems.

This can entail anything from evaluating and selecting specific firewall technologies, to implementing security procedures for controlling employee behavior.

"These guys definitely offer a service that's in demand. No doubt about that," said Ira Machefsky, a senior analyst with Giga Information Group. "The security business is typically service-intensive because there are few products that you can plug in and use. They need to be customized. And security expertise is pretty thin in most companies."

Because INS is a service-only company, it is product independent, Kaplan said. The company's network engineers have a minimum of five to seven years of industry experience working with large-scale organizations.

INS has 23 offices nationwide. Fees vary based on the size, scale and complexity of the project.

©INS: (800) 467-8100.

Customers share Java stories

Attendees of Java Day put the 500-day-old language through its paces.

By Ellen Messmer
Chicago

More than 600 technology managers recently flocked to the second annual Java Computing Day to try and get a fix on what role the new programming language might play in their organizations.

Though Sun Microsystems, Inc.'s Java is only 500-days-old, some managers see Java as the basis for their future network installations because it enables easy upgrading of client applications via any server running the Java Virtual Machine.

FLUNKING THE JAVA TEST

Since October, 37 candidates have taken the Sun-certified Java programmer exam. Here's how they fared.

Pass	13	35%
Fail	24	65%

Information systems professionals are already getting busy. Bill Phelan, Floral Transworld Delivery, Inc.'s (FTD) vice president of technology, unveiled the Java-based application FTD is building for its 23,000 floral retailers to replace the firm's proprietary order-processing network, called Mercury.

"This FTD prototype is for transaction processing," said Phelan, noting that 20% of every florist's business is actually done with another florist. "With Java, we could literally download a point-of-sale screen to them at the holidays." Use of Java would curtail having to mail out client software several times each year to each retailer.

DAVID B. SUTTON

FTD's *Bill Phelan unveiled the Java-based application FTD is building for its 23,000 floral retailers at Java Day.*

The FTD application, which integrator Open Business Systems, Inc. is developing for FTD, will let the floral retailers E-mail each other, exchange ideas in bulletin board chat sessions and place customer orders for flower delivery to distant cities. Retailers could also set up a Java-based computer kiosk to let customers look at a floral catalog and perform searches on flower type and cost.

Buck stops where?

The Java object-oriented computer language, like C++ and SmallTalk, supports the notion of reusable code. While this could be a boon, it raises thorny management problems, asserted one Java Day attendee, Dean Grippo, a programmer with Allstate Insurance Co. in Northbrook, Ill.

"Across a large organization, how do we know which objects are even available for reuse? And who takes the responsibility to support [this code] if it is reused?" Grippo noted.

In order to manage Java objects and other code, Allstate is looking at setting up an Object Re-Use Center that programmers could remotely search to find information on what software objects the company has warehoused, he said.

Pump up the volume

Sun could not resist turning up the volume on the Java hype. David Knopler, Sun's area marketing manager, proclaimed that there are now "200,000 serious Java programmers."

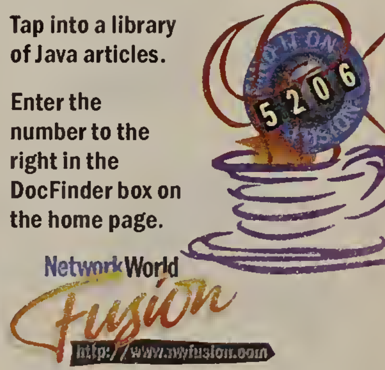
But with Java less than 2-years-old, the joke among software programmers is that anyone with three months of experience with Java is an expert.

Tom McGinn, a Java educator at Sun who presented an overview of the company's new courses for Java certification, acknowledged intensive training must get under way to create a critical mass of Java programmers and developers.

Out of a total 37 candidates who have taken Sun's Java programmer multiple-answer exam since October, 13 passed. A separate exam to become a Sun-certified Java developer is expected to start early this month. ■

Tap into a library of Java articles.

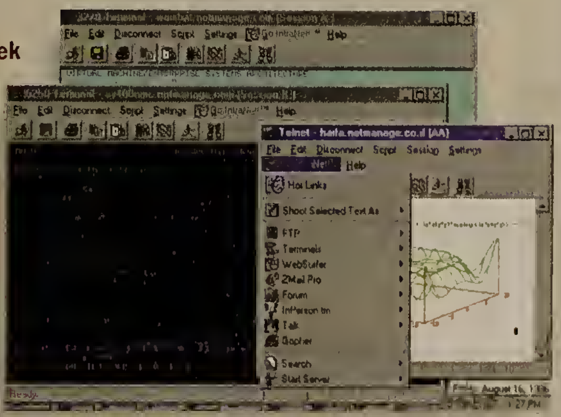
Enter the number to the right in the DocFinder box on the home page.



PRODUCT SPOTLIGHT

LOOK FOR TWO NEW CHAMELEONS

NetManage, Inc. of Cupertino, Calif., last week rolled out two new products: the $400 Chameleon NFS/X 6.0, a software package that delivers application, file system and intranet integration to Unix systems from Windows desktops; and the $400 Chameleon HostLink 6.0, a software package that enables Windows users to access IBM main-frames and Application System/ 400 systems over both SNA and TCP/IP connections.



NetManage: (408) 973-7171

'NET INSIDER

Restrictions in the unlimited

For quite some time, it has been common wisdom that there is essentially unlimited bandwidth available for the Internet and other telecommunications applications via the fiber-optic infrastructure "in the ground."

It is not clear where that idea came from. It could result from people thinking that because fibers can run at high bandwidth and there is a lot of fiber already installed, there must be more than the current and future applications can fill. But one thing is for sure: The idea did not come from the folks who are trying to find fiber to expand their backbones to meet the explosive growth in Internet traffic. Many of them are quite worried about where the bandwidth will come from in the next few years. The existing fiber plant is becoming exhausted, and new fiber builds take planning, time and money. On top of that, there may be a problem getting the fiber itself.

The New York Times reported on Nov. 4 that the worldwide demand for fiber used in telecommunications will reach 16.25 million miles of fiber this year, a market worth about $6 billion. But production has been running behind demand, and the shortfall could be more than 1.25 million fiber-miles this year. The demand has been fueled by the global telecommunications deregulation movement. In addition, the advent of competition from direct broadcast satellites is forcing U.S. cable TV companies to undertake large-scale infrastructure upgrades.

The vendors are trying all sorts of things to gain more bandwidth — from increasing the data rate to wave division multiplexing (WDM). Note that capacity and bandwidth are not the same thing. Technologies such as WDM are a way to provide more capacity by making more wires, not higher bandwidth by making faster wires. Using WDM to put four OC-48 (2.4G bit/sec) circuits on a single fiber does not make one OC-192 (9.6G bit/sec) circuit. Instead, it provides four circuits that must be independently terminated in switch or router ports.

Scott Bradner

But whatever tricks are played, when the bandwidth demand is increasing as rapidly as it is, it's a bit hard to keep up with.

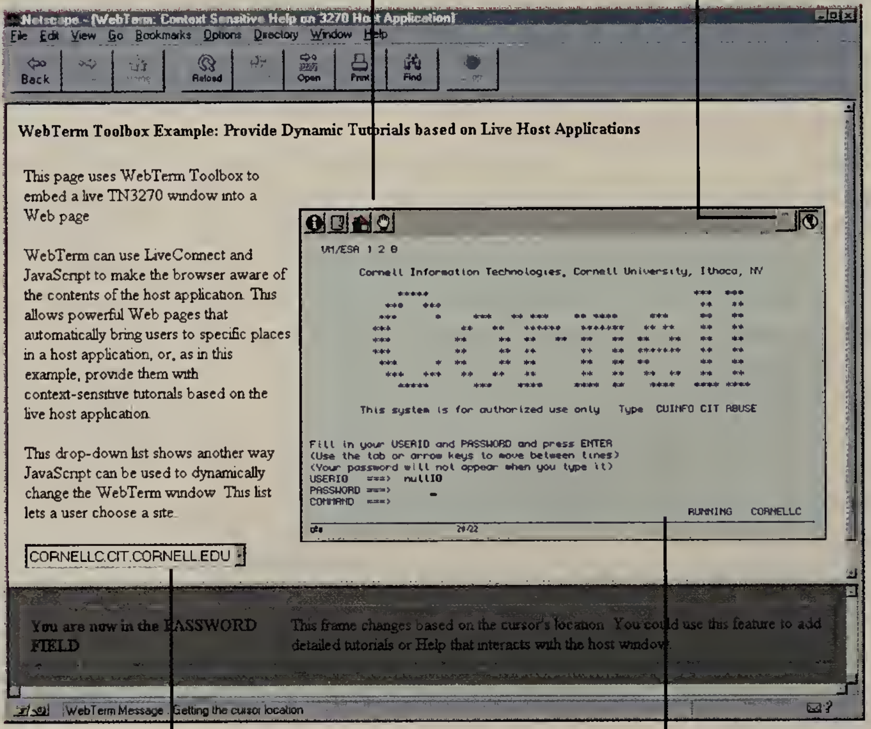
This is not another "death of the Internet is imminent" column. These problems are real, but not immediate. Instead, I'd like to turn to another topic.

One of the features of today's Internet is that there is only one product being sold: IP connectivity. It matters little if the data being transferred is a spam message, an invoice for $3 million, a real-time Internet telephone call or a piece of E-mail where it would be OK to take an extra 5 minutes to deliver. Undifferentiated products of this type leave little room for Internet service providers to compete, other than in price. If (or better, when) the network infrastructure can support multiple quality-of-service levels, the ISPs can start to compete on a basis of quality of data delivery. It also may provide a way for the ISPs to moderate the growth in their bandwidth requirements so the production of fiber and the installation of new facilities has a chance to catch up.

Disclaimer: Undifferentiated is not a term that many people apply to Harvard — in any case, the above worries are mine.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached at sob@harvard.edu.

Host Access from Your Web Browser



Netscape - [WebTerm: Context Sensitive Help on 3270 Host Application]

WebTerm Toolbox Example: Provide Dynamic Tutorials based on Live Host Applications

This page uses WebTerm Toolbox to embed a live TN3270 window into a Web page

WebTerm can use LiveConnect and JavaScript to make the browser aware of the contents of the host application. This allows powerful Web pages that automatically bring users to specific places in a host application, or, as in this example, provide them with context-sensitive tutorials based on the live host application.

This drop-down list shows another way JavaScript can be used to dynamically change the WebTerm window. This list lets a user choose a site.

CORNELLC.CIT.CORNELL.EDU

```
VM/ESA 1 2 0

      Cornell Information Technologies, Cornell University, Ithaca, NY

      This system is for authorized use only   Type  CUINFO CIT ABUSE

Fill in your USERID and PASSWORD and press ENTER
(Use the tab or arrow keys to move between lines)
(Your password will not appear when you type it)
USERID   ===>  nullID
PASSWORD ===>
COMMAND  ===>
                                                RUNNING   CORNELLC
```

You are now in the PASSWORD FIELD

This frame changes based on the cursor's location. You could use this feature to add detailed tutorials or Help that interacts with the host window.

WebTerm Message: Getting the cursor location

Custom Macros

Connection Status Indicator

Enhanced Functionality with JavaScript

Full Terminal Emulation

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Technology Update

Keeping Up with Network Technologies and Standards

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Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I am trying to configure E-mail for our company. We have between 30 and 50 users who will be on the LAN, and 10 mobile users and 18 remote offices that will need at least one basic dial-up E-mail account. All of the users are running Microsoft Corp.'s Windows 95 operating system.

What do you recommend for an enterprise E-mail plan?

Via the Internet

You could go with an E-mail package such as Lotus Development Corp.'s cc:Mail, Microsoft's Mail or Novell, Inc.'s GroupWise. The requirements of the mobile users and remote offices will factor heavily into your decision.

Using the dialer shipped with Windows 95, a user can connect to the main network as a remote node through NetWare Connect server. With this link, a user should be able to retrieve E-mail and access data residing on the corporate network.

Or, depending on how spread out the mobile users and remote offices are, it may be more practical to buy connectivity from a national Internet service provider, such as Netcom On-Line Communications Services, which offers local dial-in numbers.

The remote offices could dial up as single entities, or each user could access E-mail through a local gateway.

You'll also need to consider the hardware required at the corporate site to support the remote users. Using cc:Mail will require one PC for the cc:Router, and potentially, additional PCs for gateways needed to transfer E-mail to the Internet and other networks.

MS Mail has similar constraints, but those may change with Exchange.

Novell's GroupWise can run as NetWare Loadable Modules (NLM) on a NetWare server.

Most of the gateways also run as NLMs, thereby minimizing the number of extra PCs required for gateway duty.

Get a grip on asset management

A slew of new tools that feature electronic discovery agents help identify, track and manage net and PC resources, reducing the manual labor previously needed.

By David Hall

A new swarm of asset management tools that identify, track and manage network and PC resources eases pressures to monitor fast-paced changes assaulting the network migration to next-generation technology.

The assortment includes asset inventory programs that use electronic discovery agents to reduce much of the manual labor involved in ongoing hardware and software tracking. Applications such as Tangram Enterprise Solutions, Inc.'s Asset Insight and Tally Systems Corp.'s NetCensus also provide central databases for storing asset information.

These tools use logon scripts to run collection agents locally or from a server on the PC at bootup. These agents recognize the workstation's hardware (processor, memory and model) and software (systems file changes and versions) configurations. The agents report back to a centralized Microsoft Corp., Oracle Corp. or Sybase, Inc. database, typically a dedicated server with more than 32M bytes of memory.

At only about 10K bytes, the packet being sent to the server is peanuts compared to Internet graphics downloads. Nonetheless, you can limit packet traffic by using standardized polling and reporting times.

Automated processes

A benefit of these new tools is automated distribution of agents. In just a few hours, you can write a batch script to push the tracking software down to all the servers. Then, when users boot their PCs, another script executes and distributes agents to the individual workstations.

But no rollout is completely automated. Once the electronic agents are deployed, users or IS personnel need to manually enter existing asset tag and personal user information on each workstation. (An asset tag is a bar code and number physically attached to PCs, printers, fax machines, copiers and other devices. The tag contains unique numbers identifying the particular piece of hardware.)

Over time, new PCs and servers can be preconfigured with collection agents, further reducing labor. Many resellers, in fact, can fix asset management tags on hardware, load a company's unique applications and network configurations, install asset management agents on PCs and servers, and enter asset information before shipping. Once PCs are online, agents will report back to centralized servers and confirm the hardware deployment.

Tool integration

Although these tools typically offer some capabilities across multiple functions, no single application can manage and report on all computing assets. Discovery, metering and support tools need to be used in tandem to get a complete picture.

Most tool providers note scores of compatible products, leveraging industry-recognized protocols such as the Management Information Format. But no magic formula exists. The right mix of tools depends on your network infrastructure, and your IS and business needs. And the tools will only be as effective as the processes they support.

For example, enterprises that use Windows NT can couple an enterprisewide management framework such as Microsoft's Systems Management Server (SMS) with autodiscovery and inventorying tools. The hierarchical, distributed processes and scalability offered by SMS makes it a good centralized repository for diverse tools handling day-to-day asset tracking and reporting.

SMS and other network management frameworks provide other valuable capabilities, too. For instance, they enable managers to take control of individual Windows and NT desktops and servers, and managers often can analyze network traffic to help pinpoint and plan new technology deployments.

Sharing data among tools also encourages the distribution of information across the enterprise to reduce overall management costs. When planning asset management reporting, first identify who will benefit from access to the information. For example, help desk staffers would probably be able to provide better support if they could pull crucial information on a PC's configuration, such as model, make, serial number, purchase date and warranty, from a centralized asset database.

Unlike traditional management tools, the best discovery and tracking tools have flexible, easy-to-run reports that deliver information in nontechnical formats. Tools with robust reporting engines, such as Tangram's Asset Insight, generate graphs and charts predicting hardware needs and costs for operating system or application upgrades. Passing this highly digestible information to decision makers can support recommendations to senior management on the enterprise's ability to handle new technologies before they hit the network.

Business integration

The best asset management programs integrate tools with sound practices that streamline procurement and support operations. Before you buy, it's essential to thoroughly assess how your organization integrates and supports its technologies.

Changes in front-end processes, such as the implementation of standard desktop configurations, can reduce the breadth of inventory to manage.

Hall is chief technology officer at CompuCom Systems, Inc., a Dallas-based distributed PC and network services provider. He can be reached at the company's West Deptford, N.J., office at (609) 224-5200 or via the Internet at dhall@compucom.com.

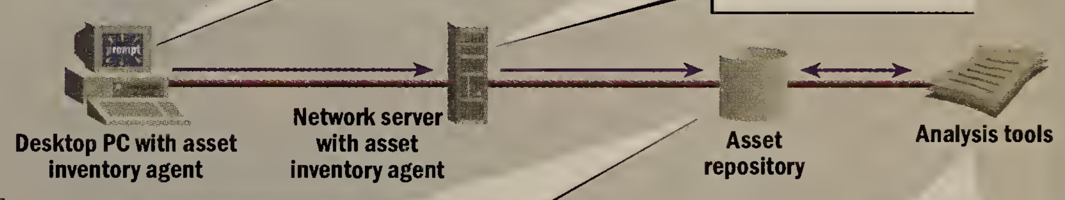
HOW IT WORKS

Electronic asset inventory

Asset inventory programs use electronic agents to automatically gather configuration information from desktop computers and servers. They reduce the manual labor involved in ongoing hardware and software tracking.

1 An electronic agent automatically collects information on PC configurations at predetermined intervals and periodically prompts users to confirm personal information. The agent packetizes the data and sends it to a server's TCP/IP address.

2 The server collects desktop inventories and forwards them, with its information, to a centralized asset repository.


prompt
Desktop PC with asset inventory agent
Network server with asset inventory agent
Asset repository
Analysis tools

3 The repository stores the inventory information and builds the data access structures for reporting and interfacing to analysis engines.

4 Analysis tools can automatically summarize the information and generate reports. The tools can access data directly for specific inquiries. Advanced tools predict hardware and software needs for migrating to new technologies.

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5. Understand the evolution of data networking, from DDS and X.25, through T/E-Carrier, ISDN, SMDS, Frame Relay, ATM and B-ISDN
6. Differentiate between bridges, routers, brouters and gateways — what they do and where they fit
7. Learn the nature of current and developing infrastructure technologies, including ADSL, HDSL, SONET, Wireless Local Loop (WLL) and hybrid local loops
8. Understand the differences between circuit, packet, frame and cell switching
9. Develop an informed and meaningful strategy for the transition to Broadband Networking through SMDS, Frame Relay and ATM
10. Compare and contrast the options for wireless data networking in the LAN, MAN and WAN domains
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EDITORIAL *insights*

Playin SNA-over-frame game

Thinking about finally moving SNA applications off those old, multidrop private lines and onto frame relay?

AT&T recently gave users what appear to be two good reasons to take the plunge. First, the carrier lowered frame relay prices while raising private-line prices. Then it introduced a program to install and manage frame relay access devices (FRAD) used to convert SNA traffic to frame relay.

So it's a no-brainer decision, right?

Not so fast.

It's no surprise that AT&T's frame relay price reduction was followed by an offer to manage customer premises equipment. Why? Long-distance carriers need to find new sources of revenue. The profit margin on high-volume calling plans is coming down — way down. Competition is driving the price of corporate telephone calls to off-net locations as low as 5 cents a minute, even though the carrier still must pay a regional Bell operating company 3 cents on the terminating end for switched access.

AT&T did not announce the price of its managed FRAD service, but managed WAN services run as high as $300 per month per site over and above transport costs. Considering that a 64K bit/sec AT&T frame relay port costs only $255 a month, that's quite a chunk of money.

Keep in mind that the managed FRAD services — particularly the option where AT&T places devices in its central offices — don't do much for consolidating your networks. AT&T officials call the service a multiprotocol offering, but only in the sense that it can run both SNA and bisynchronous applications over frame. As one analyst told me, "This doesn't do much for the user in the branch office who wants to do SNA applications and get on the Internet."

And it remains to be seen how AT&T will handle any new wave of frame relay users. AT&T's frame relay installation intervals reportedly have already slipped back again — from 28 to 45 days — although that need not be a big concern if you know about it ahead of time.

None of this is to quibble with AT&T's effort. The carrier faces a unique situation in dealing with SNA over frame relay because of its enormous private-line installed base. In our interview in this week's issue, AT&T Executive Vice President Gail McGovern joked about the saying around AT&T headquarters that "God was able to create the world in seven days because he didn't have an embedded base" (see page 21).

But other carriers are making an aggressive play for AT&T private-line users that want to migrate SNA applications to frame relay. It's likely to be one of the biggest issues of 1997. And it never hurts to keep your options open.

David Rohde, senior Washington correspondent drohde@nww.com

Network Performance • Jeffrey Kaplan

Getting intranet-ready is harder than it seems

If last year's craze was getting on the 'Net, this year's is building your own corporate intranet.

However, many organizations are plunging into the intranet development process without a clear understanding of the significant investment required to become intranet-ready.

Implementing intranets requires six major components:

- High-speed router or switched backbone networks to ensure adequate bandwidth
- Reliable remote access devices to permit end-user connectivity
- Solid network security to safeguard proprietary information
- Sophisticated network management systems to monitor network activity
- Trained personnel to plan, design, implement and manage the network
- Documented procedures to guide the network operations staff

While these elements may seem obvious, it is surprising how many organizations fail to put them in place before rolling out their intranets. Then, when their first intranet attempts collapse, these firms must backtrack and reinforce their network infrastructure. These initial failures undercut end-user confidence in the intranet effort and diminish its potential success.

Gartner Group, Inc. estimates that implementing an intranet can easily triple an organization's network traffic load. So why don't more of them take the time to ensure they have solid network infrastructures in place before they initiate an intranet?

The most obvious reason is that many are in too big a hurry. With the intranet hype extending beyond the trade journals to the general business press, corporate executives and end users alike are clamoring for their own intranets to keep up with the crowd.

Many see intranets as a panacea that will allow them to leave their past internal communications problems behind. Few recognize that implementing an intranet can make their corporate networking problems even more painful. In cases where the network infrastructure is not adequate to withstand the added data traffic, invariably the result is a slowdown in network performance and response times, a greater number of crashes and increased end-user frustration.

Therefore, an important step in the intranet development process should be a thorough assessment of the current network infrastructure. Conduct a baseline study to measure current network traffic levels and determine if there is sufficient bandwidth to accommodate the added load of a corporate intranet. Then, use industry benchmark data to estimate the additional traffic load and determine the incremental bandwidth requirements. After the intranet is implemented, conduct ongoing network performance analyses to measure the real-time impact of the new corporate communications system.

Finally, don't ignore the organizational requirements for intranet success. Expect to increase, rather than decrease, staffing levels and training to ensure that the enhanced network infrastructure is properly supported. And be prepared to restructure your in-house network support team to accommodate the multidimensional needs of end-user departments attempting to capitalize on the intranets.

Many industry pundits have suggested that intranets will change the economics of corporate computing, and they are right. Most organizations have found implementing intranets far more costly than they anticipated and far more frustrating.

Those who have overcome the initial costs, both in terms of dollars and organizational disruption, are beginning to realize the payback of these new computing models.

Having realistic expectations for the upfront investment required to successfully implement intranets is the first step toward reaping the operating efficiencies and monetary benefits intranets can generate.

Kaplan is director of strategic marketing for International Network Services, a Sunnyvale, Calif.-based network services company. He can be reached at his Boston-area office at (617) 376-2450 or via the Internet at Jeff_Kaplan@ins.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

Online, all the time

In his column, "The choice is yours: Get on the 'Net or polish up your resume" (Oct. 28, page 18), Kevin Tolly makes what I consider a very irresponsible suggestion: He encourages people to use $20-per-month personal Internet connection accounts as 24-hour links to the Internet. People who do as Tolly suggests would not only be violating most user contracts I have seen, but also hogging for themselves, 24 hours a day, a resource that is intended for up to 10 users.

Most Internet service providers will provide you with your own modem port for 24-hour connections to the Internet

Network Convergence • Mary Johnston Turner

The BT/MCI merger: Is bigger better?

The $21 billion British Telecommunications plc/MCI Communications Corp. merger generated the type of large-print headlines reserved for only the industry's biggest news. The merger, like the Bell Atlantic Corp./NYNEX Corp. and LDDS WorldCom/MFS Communications Company, Inc. mergers an-nounced earlier this year, is clearly motivated by a desire to achieve economies of scale and to consolidate market share in today's highly competitive communications market.

The companies certainly have a lot to work with — fixed assets of more than $10 billion in the case of MCI, and more than $26.6 billion in the case of BT. And since 1993, the two carriers have jointly operated a successful global managed services business, proving they know how to work together. They plan to fund MCI's buildout of local-loop facilities in 25 top U.S. markets, a move that, some analysts suggest, will enable BT/MCI to reduce local calling rates by as much as 50%.

Several key factors will determine whether this merger will actually play out to the benefit of customers and stockholders. These include the following assumptions:

- Facilities-based competition matters.
- Being able to drive down the price of bandwidth to the lowest levels among all competitors is a good thing.
- Network facilities spread across two continents can be managed more efficiently, and at lower cost, than two separate sets of facilities.
- The installed base of network switches and transmission plants is an asset rather than a boat anchor.

If all of the above assumptions are true, the new BT/MCI Concert venture, having the biggest scale of any of the recent mergers, should do very well.

However, what if the nature of technology is changing the ground rules regarding economies of scale? What if overbuilding in the long-haul arena means that facilities ownership is not critical? What if driving down prices simply lowers margins across the industry, rather than delivering higher profits to the price leader? What if the tools needed to manage these very large networks fail to scale effectively across time zones? And what if the end is near for switched voice and private-line networks?

Does a large legacy base of switches designed for the pre-Internet era act as a bottleneck to effective competition? Can newer players optimized to operate in an all-cell or all-packet world do so at a better overall level of profitability than operators of legacy systems can ever achieve by pushing scale?

Actually, the fundamental question is whether scale matters. BT/MCI is betting big that it does. For corporate network managers, however, the scale arguments may not be so compelling.

It's my guess that you care more about whether the new, combined network can meet ever-growing demand for Web traffic and Internet/intranet connectivity. You probably care about whether you can get end-to-end service levels off the shelf quickly rather than via long-term, highly customized managed service or outsourcing deals. And you probably want your supplier to give you solid advice about capacity, planning and performance, and help you make decisions about whether to put all your international voice traffic over the Internet. You'd probably like your carrier to set up and manage a global directory and addressing plan or help you implement a global E-mail or even build a global transaction processing utility for your business and trading partners. Again, you'd like these capabilities to be standard offerings, not big, complex, onetime custom deals.

With all the hoopla surrounding the BT/MCI merger, very little detail has come out as to how the merged company will leverage technological innovation to do business differently. At the end of the day, IT managers should certainly take what they can get in terms of discounts, particularly when the services, such as voice, fax and leased lines, are largely commodities anyhow.

However, when making choices about your strategic network partners, look at more than the total combined assets and the geographic distribution of the workforce. Look at where the service provider is spending its capital dollars. Old or new, large or small, you want a supplier that is investing in bandwidth and infrastructure for the future — a future that is going to be dominated by cells, packets and IP. Investing in duplication of existing local facilities or upgrading old technologies may result in some near-term cost reductions, but it doesn't mean your supplier can really support the global service utility needed to make your business hum.

Finally, keep an eye on how much of the capital budget is going into new vs. legacy technology. The best long-term partner for you is the one that will have the right type of facilities ready when you need them.

Turner is a vice president with Northeast Consulting Resources, Inc., a Boston-based consulting company. She can be reached at (617) 654-0619 or via the Internet at turner@ncri.com.

— but this costs more than $20 per month.

Please do not encourage irresponsible modem behavior by people who dial in to the Internet through an ISP.

Chad Leigh
President
Pengar Enterprises, Inc.
South Jordan, Utah

Tolly responds: I am not recommending users violate any service agreements. If anyone is encouraging irresponsible behavior, it is the ISPs offering "unlimited" connect time for a flat fee. If I am a home office-based corporate worker and I want to stay online all day (and all night), that would seem to be within the bounds of the unlimited connect time most ISPs advertise. After all, how can ISPs impose limits on something sold as unlimited?

All in the game

Regarding your editorial "The LEC junkies" (Nov. 4, page 56):

You must be new to the business of regulated competition based on your comments regarding the local exchange carriers using the drug of "legal wrangling" to delay implementation of the new Federal Communications Commission's rules on how competitors can use their net. MCI Communications Corp. used a similar army of lawyers a number of years ago to find loopholes and procedural means by which it could disadvantage AT&T. (In those days, MCI had more lawyers than engineers on its payroll.)

And I presume you don't see any parallels with the legal maneuvering on what evidence to admit or exclude in any criminal trial, or any football coach with a well-timed complaint to the referee?

This is all part of the game. If you want to have the government's hand in the marketplace, it — being full of good bureaucrats — sets up lots of rules. This invites companies to focus on these rules, rather than on customers.

Mike Heller
Manager, marketing programs
Cisco Systems, Inc.
San Jose, Calif.

Only on NT

Your article "Life with a mixed NOS environment" (Oct. 14, page 32) mentioned Compaq Computer Corp.'s Insight Manager. As a loyal Compaq customer, I was very disappointed to find that Insight Manager console software will run only on a Windows NT workstation (apparently this started with Version 3.0). Not everyone in the world has, or wants, an NT workstation.

As a network administrator who has been encouraging other net administrators with Compaq servers to take advantage of Insight Manager, I feel pretty unhappy — especially since we pay almost $400 per server per year to maintain our Compaq SmartStart (which includes Insight Manager) licenses. Wish someone had asked my opinion.

Jana Brown
Systems analyst
Arizona State Univerity
Tempe

Teletoons

Happens every time a shipment of softmodems comes in!
HUT!! HUT!!
SOFTMODEMS
THIS END UP
Phil Frank

Web server

Management tools that let you

By Mark Gibbs

MIKE KASUN

Your Web server is humming along, dishing out page after page of useful and enlightening data to anyone who wants to see it. All the while, it's keeping detailed records on how many visitors flock to your site and the documents they retrieve. Your Web server is efficient and effective.

Or is it?

The awful truth is, there really isn't an easy way to know. Let one internal developer add a page or even slightly modify one, and a critical hotlink disappears without a trace — and always without warning. Further, it is painful to paw over the reams of activity records that continuously spew forth from Web server logs to get even the most basic data concerning visitors.

But before you hire someone to do nothing but click away on your site all day just to make sure those embarrassing 404 messages don't pop up, have a look at some emerging Web server management tools.

These tools, a mix of stand-alone offerings and features bundled with Web server software or authoring products, can help you understand how well your site functions, what you've actually got stored on it, who is visiting and what they are accessing.

The major problem is the lack of one package that does it all. It will take vendors a few years to build truly integrated suites of Web management tools, so for now you'll have to buy a mishmash of packages, each with its own nifty little specialty. You'll need one product to map the contents of your site in great detail, taking care to show the relationships between pages.

And you'l require another to tell you about the behavior of users tapping into your server, yet another to monitor hyperlinks and still another to monitor server performance. You name it, and it seems you need a package for it.

To make life a little easier, we've included in this Buyer's Guide tools that can meet what many consider the two most pressing needs of any Webmaster: analyzing server logs and keeping track of content.

Log analyzers are a basic form of Web server management. They help you get a handle on the amount of raw traffic coming into the server, identify bottlenecks, and uncover when and why a particular server is overloading. Armed with this data, you can decide whether to set up mirrored sites or do some form of page caching.

We're already seeing second-generation log analyzers that augment data on the number of hits per day and per domain with a finer grain of detail and a more in-depth extraction of event sequences from the logs.

Content managers can help you track storage locations of all the text, graphics and other files used to build Web pages. They can also help you stay apprised of how large the pages are and help you find out when someone has created or changed a page.

Some content mangers will automatically rebuild links when pages are added or changed, while others include a filtering feature that periodically checks to make sure broken links aren't going into production pages.

viewmasters

peer into Web server problems and keep on top of trends.

As you examine these tools, remember one simple thing: Web server software was not designed with manageability as a priority. Rather, the primary concern was serving up preformatted documents consisting of text, images, graphics and other data to interested visitors in the unreliable communications environment that is the Internet.

The root of all problems

To do this, Web servers rely on HTTP, a stateless protocol that doesn't provide much information about the identity of users or the environment in which it runs.

Sure, Web servers were designed with event loggers to record every request for information entered by users, every response the servers provided and every error encountered in providing service. That information is written to a Web server log file and, as you've probably guessed, that file gets huge fairly fast, which means the amount of useful information you can cull from it is minimal without the aid of an analysis package.

The vast majority of log analyzer products run as separate processes from the Web server software on a stand-alone PC or workstation under Windows NT or 95. In general, the most sophisticated graphical analysis output is found on Windows-based products. Interestingly, none of the products we've encountered support OS/2, and only two support Macintosh (see chart, page 44).

AT YOUR SERVICE

There are a number of companies that, for a fee, will collect your Web server logs and prepare independent statistical reports on site usage. Among them are:

- ▶ **Internet Profiles Corp.,** which markets I/Pro services that give you audited reports on Web site usage, site visitor demographics based on registration forms and usage trend analysis.
- ▶ **Audit Bureau of Verification Services, Inc. (ABVS),** an Audit Bureau of Circulation subsidiary that verifies your log files, and prepares and audits site usage reports. ABVS is targeted to advertiser-supported sites that need an independent source to produce data about site visits.
- ▶ **BPA Interactive,** a part of BPA International that offers services that compete with ABVS. *Network World* recently became the first trade publication to have its Web site, Network World Fusion, undergo a BPA Interactive audit.

Log analyzers must have access to the Web server log files, and there is no such thing as a standard log file format today. Indeed, there are at least 20 major log file formats and variants. Most analyzers are pretty versatile when it comes to understanding these various formats. But the problem comes when you want to include log data from other services, such as File Transfer Protocol servers, to complete the picture of your online performance. The integration of logs from other services is not at all common in Web analyzer tools.

So what are these analyzers going to tell you? Well, they can produce reports on just about any common Web server activity, including:

- ■ Most and least requested pages.
- ■ Number of online transactions, such as site registration requests, submitted for processing.
- ■ Number of Common Gateway Interface events.
- ■ Number and type of errors reported.

Many of the products will even tell you how many times a page was downloaded (with and without images).

Some products, such as those from e.g. Software, Inc., WebThreads LLC and net.Genesis Corp., will produce an audit trail for each visitor. Essentially, these analyzers create a log entry for each new visitor based on that visitor's network address. Each click or command the visitor executes is recorded, giving Webmasters the ability to see exactly what path each visitor used to navigate the site.

Just about any analyzer enables you to generate reports at various time periods, such as hourly, weekly and monthly. These reports can be output to a printer or an HTML file, which can be viewed by a Web browser or by direct file access. In most commercial environments, you'll probably want to restrict access to the reports because they reveal a lot about your markets and the success of your online presence — just the kind of competitive information that should be kept confidential.

Thanks to the Web's communications architecture, there are limits to what log analyzers can do, but vendors are at work trying to overcome them. For example, there is no direct way to determine the amount of time a user spends reading a document once it has been downloaded. Products such as Interse Corp.'s Market Focus 2 attempt to infer that time period by tracking how long it takes for each visitor to request the next document. However, that user could have gone to get coffee or taken a phone call before making the next request.

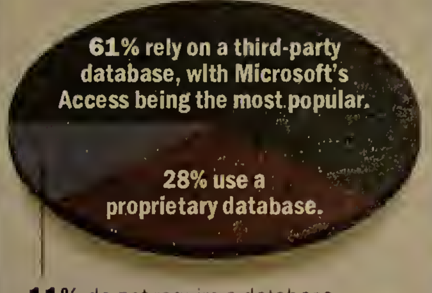
A sophisticated log analyzer will provide statistics that are sliced and diced to incredible depth. This makes understanding what reports are actually important part of the challenge for a Webmaster. And many of these products use crude graphics, making the challenge all the harder.

For example, one of the big issues for a Webmaster is figuring out which parts of the organization's site are heavily used and which are neglected. Often, a document you would like to give more visibility is referenced on a page with many other links. If any of the other links lead to topics of greater interest, the document you want to be seen may not be called up, in effect making it invisible to your audience.

It would be nice if you could see a layout of Web documents color-coded according to the hit rate. This would make identification of problem areas simple. Alas, this kind of visualization is not available yet in log analyzers.

DATABASE SUPPORT

Of the 18 products listed in the Buyer's Guide chart on page 44:



Content with content

If analyzing Web activity is a pain, analyzing, managing and maintaining actual Web content can be a nightmare. What you need to track is basic information about the type of files in the Web site, their attributes — such as file size, when pages were last modified and who performed the modifications — as well as how many and what types of links exist, which links don't work and so on.

There are three major approaches to making Web content understandable. The first is to pull information together using a text-based reporting tool that — much the same way as the log analyzers do — slices and dices statistics on the number of documents, their types and their links, including images.

The second approach is to use a tool that creates an inverted tree diagram in which the Web server is the root and all pages linked to it are leaves or, if they link to other pages, branches. The third choice is to use a node-and-line diagram that shows the linkage between Web components. These last two approaches require some kind of iconography to display Web content. Plotting content in a graphical form makes it easier to distinguish types of Web components from each other, see broken links between URLs and identify other content problems.

Content managers and analyzers generally run on client PCs. Vendors such as Inso Corp., EveryWare Development Corp. and Microsoft Corp. extend the server environment with software to support document management and access control for people editing Web documents. To begin the analysis, the utility needs to scan the Web site's contents.

At this point, the tool acts as an automated Web browser, fetching each page and examining all in-line links on those pages, including Java applets, and links to other documents. With some products, the items can be saved, enabling you to build a local copy of the site being analyzed. As each item is found, the analyzer adds information about it to a database. Once the database is complete, reports on broken links, document sizes and other content-related matter can be generated.

Microsoft's FrontPage 1.1 differs slightly. It can only manage content for Web sites it has been used to build.

NetCarta Corp. has an outstanding and novel graphical tool called the Cyberbolic interface in the latest version of its CyberPilot Pro, a program for end users. The interface captures the details of a site as a map and displays information about the content. It shows a site in a graphical view that enables users to click on icons to explore connections among documents.

Some products use more than one type of Web content portrayal, and most allow the view to be filtered and searched. This allows quick identification of broken URLs. Products such as Inso's DynaBase Web Management System 1.0 actually have mechanisms to alert Webmasters problem links and make an automatic

NetworkWorld
TECHNICAL SEMINARS

"IP is becoming the common coin of enterprise networking and understanding where IP is going is a high priority for network professionals."
John Gallant, Editor-in-Chief, Network World

IPv6
THE NEXT GENERATION FOR TCP/IP INTERNETWORKS

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Preparing for the Next Generation Internet Protocol

The next generation of Internet Protocol — IPv6 will significantly impact your TCP/IP-based internetwork. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities. The addressing issue has been one of the most significant concerns as it was predicted that the Internet community would run out of available addresses, thus limiting the growth of this critical communication resource.

In late 1990, the Internet Engineering Task Force (IETF) initiated efforts to select a successor to the IP. In late 1993, the IETF formed the Internet Protocol — Next Generation (IPng) working group, which was chartered with investigating the various proposals, and recommending a course of action. The outcome of those efforts produced what is now known as IP version 6 (IPv6), which is currently being implemented by many vendors.

Perhaps more importantly, IP is the foundation of the TCP/IP protocol suite. Therefore if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and application programming interfaces.

Whether you are a network manager, designer or software developer, this seminar will provide you with information on the widespread ramifications of this new protocol. You will learn how to effectively plan and implement a successful, orderly transition.

TOPICS YOU DON'T WANT TO MISS!

✓ **Learn how the implementation of IPv6 will allow continued expansion of the global Internet**

✓ **Discover key features of IPv6, including larger addresses and security**

✓ **Learn how to strategically plan your transition from IPv4 to IPv6**

KEY BENEFITS OF ATTENDING

- Understand the limitations of the current Internet Protocol — IPv4
- Learn details of the proposed IPng solutions: CATNIP, TUBA and SIPP
- Understand the key functional and protocol enhancements incorporated into IPv6
- Analyze the formats of the IPv6 packet header, extension headers, ICMPv6 messages, Neighbor Discovery messages and others
- Gain detailed insights into how the IPv6 transition will affect other protocols, such as Ethernet, token ring, RIP and OSPF
- Explore the effects of IPv6 on other elements of your internet or intranet architecture
- Learn how leading vendors such as Bay Networks, Cisco Systems, Digital, FTP Software, Sun and others are implementing IPv6
- Discover how to obtain public domain sources of further information on IPv6

1996 LOCATIONS AND DATES

Chicago, IL	September 26	Boston, MA	November 8
Washington, DC	October 10	Irvine, CA	December 3
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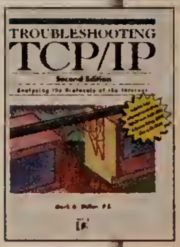

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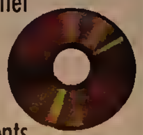

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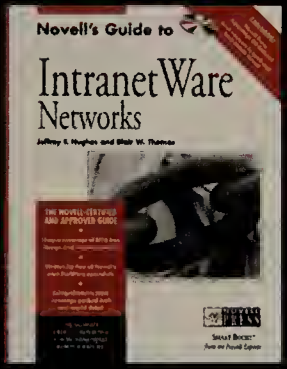

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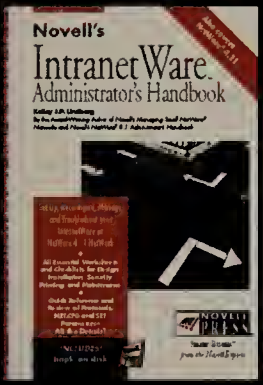

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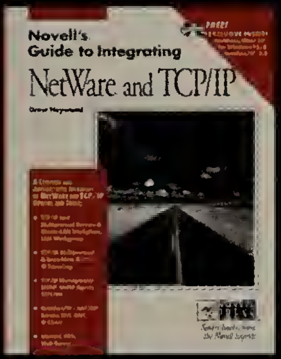

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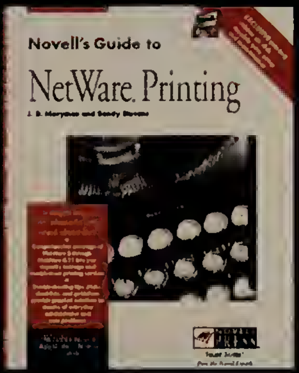

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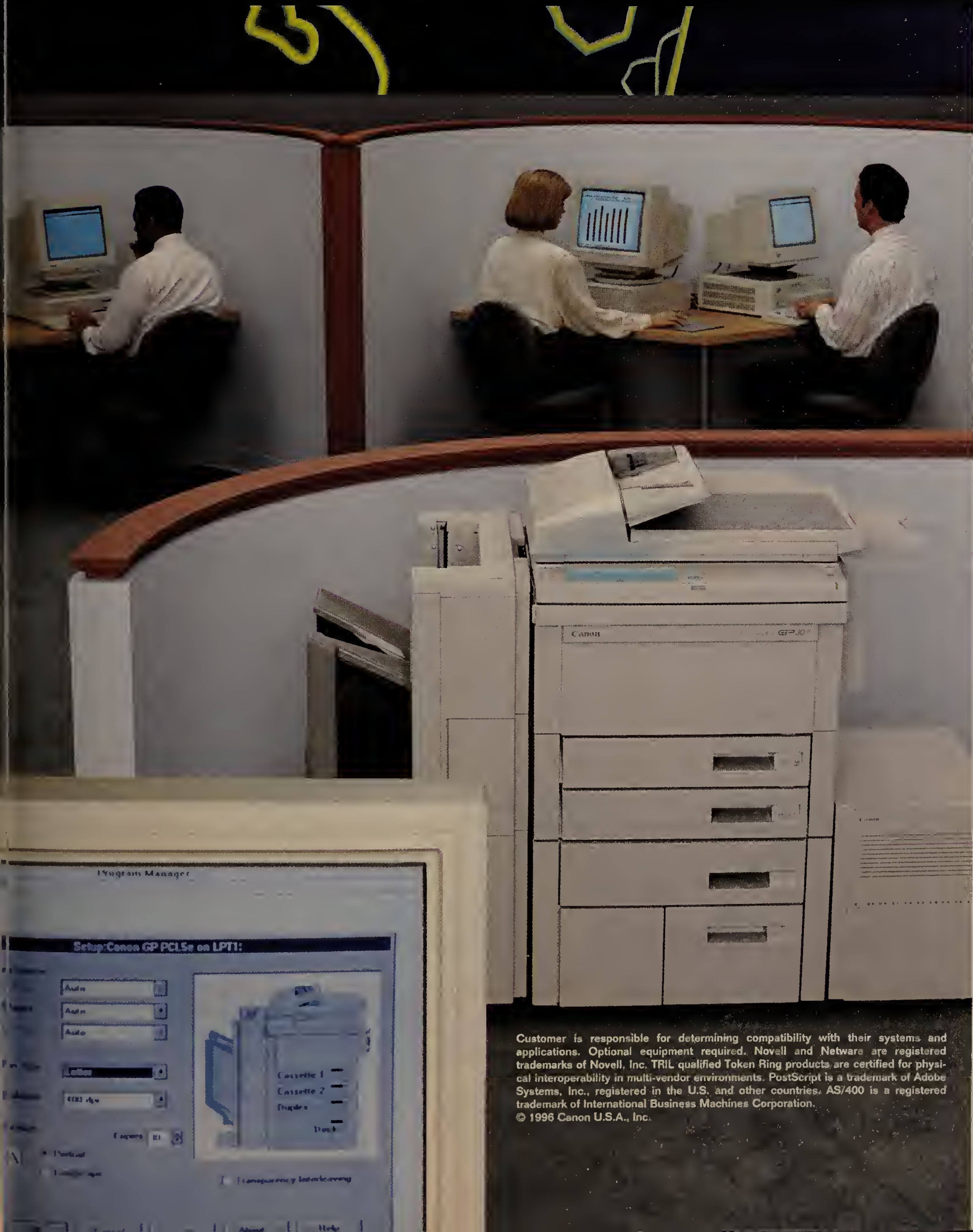
WEB SERVER MANAGEMENT TOOLS

Company	Product	Packaging	Operating requirements		Link management features								Mapping features	Log analysis features								Price
			Operating system (memory in bytes)	Disk space (bytes)	Checks for broken links on single internal Web server	Checks for broken links on multiple internal Web servers	Checks for broken links to external sites	Automatically rebuilds links when content is moved or changed	Lists number of links per page	Lists number of links to specific internal resources	Lists number of links to off-site resources	Describes the relationship between links		Number of HTML page hits	Number of image downloads	Number of CGI-bin events	Peak traffic periods	Number of online transactions submitted to site	Number and type of errors reported	Tracks which records were fetched during database query	Identifies the pages each person viewed when visiting the site	
Andromedia (415) 278-0704 http://www.andromedia.com	Aria	Stand-alone	Unix (32M)	500M	●				●			●		●	●	●	●	●	●			$1,800-$50,000
e.g. Software, Inc. (503) 294-7025 http://www.webtrends.com	WebTrends 2.1	Stand-alone	Windows 3.1, NT, 95 (8M)	10M										●	●	●	●	●	●	●	●	$299
EveryWare Development Corp. (888) 819-2500 http://www.everyware.com	Bolero 1.0	Stand-alone	Macintosh (4M)	10M										●	●	●	●	●	●			$995-$4,995
InContext Systems, Inc. (800) 263-0127 http://www.incontext.com	InContext WebAnalyzer 1.1	Stand-alone	Windows 3.1, NT, 95 (8M)	8M	●	●	●		●	●	●	●	Internal site by URLs; external sites by URLs; site map display.									$79.95
Inso Corp. (800) 981-8705 http://dynabase.ebt.com	DynaBase Web Management System 1.0	Netscape plug-in	Windows NT, 95 (8M) on client, (128M) on server	10M for client, 50M for server	●	●		●	●	●	●	●	Internal site by URLs; site map display.									$295 for client, $3,995 for server
Interse Corp. (408) 732-0932, Ext. 235 http://www.interse.com	Market Focus 2	Stand-alone	Windows NT, 95 (16M)	30M										●	●	●	●	●		●	●	$3,495
ISYS/Odyssey Development, Inc. (303) 689-9998 http://www.isysdev.com	ISYS Web 1.2e	Stand-alone	Windows 3.1, NT, 95 (16M)	5M								●		●	●		●	●	●	●		$5,200
Marketwave, LLC (800) 521-8176 http://www.marketwave.com	Hit List Pro 2.0	Stand-alone	Windows NT, 95 (16M)	12M	●	●	●							●	●	●	●	●	●	●		$1,995
Microsoft Corp. (800) 426-9400 http://www.microsoft.com/frontpage	Microsoft FrontPage 1.1	Bundled with Web authoring tool	Windows NT, 95 (8M-16M)	15M	●	●	●		●	●		●	Internal site by URLs; external sites by URLs; site map display.									$149 (1)
net.Genesis Corp. (617) 577-9800 http://www.netgen.com	net.Analysis Pro 2.0	Stand-alone	Unix, Windows NT, 95 (32M)	1G										●	●	●	●	●	●		●	$4,995
NetCarta Corp. (800) 461-2449 http://www.netcarta.com	NetCarta WebMap 1.1 for Unix and NetCarta WebMap 1.0 for Windows	Stand-alone	Unix, Windows 95 (8M-16M)	7M	●	●	●		●	●	●		Internal site by URLs; external sites by URLs; site map display.									$499-$999
Netscape Communications Corp. (415) 937-2555 http://home.netscape.com	LiveWire Site Manager 1.0	Bundled with Web authoring tool	Macintosh, Unix, Windows 3.1, NT, 95 (12M-16M)	10M	●		●	●	●	●												$295
O'Reilly & Associates, Inc. (707) 829-0515 http://software.ora.com	Statisphere 1.0	Stand-alone	Windows NT, 95 (12M-16M)	4M										●	●	●	●	●	●	●		$399
	WebSite 1.1	Bundled with Web authoring tool	Windows NT, 95 (12M-16M)	10M	●	●	●	●	●			●	Internal site by URLs; external sites by URLs.	●	●	●	●	●	●	●		$249
	WebSite Professional	Bundled with Web server	Windows NT, 95 (12M-16M)	35M	●	●	●	●	●			●	Internal site by URLs; external sites by URLs.	●	●	●	●	●	●	●		$499
Process Software Corp. (800) 722-7770 http://www.process.com	Purveyor WebServer	Bundled with Web server	Windows NT, 95, NetWare, OpenVMS (16M)	26M	●	●	●		●	●	●		Internal site by URLs; external sites by URLs.	●	●	●			●			$495
WebManage Technologies, Inc. (914) 697-7555 http://www.webmanage.com	NetIntellect 1.1	Stand-alone	Windows NT, 95 (16M)	100M										●	●	●	●	●	●			$149 (2)
WebThreads, LLC (888) 847-3348 http://www.webthreads.com	WebThreads 1.1	Stand-alone	Unix, Windows NT, 95 (200K)	5M										●	●	●	●	●	●		●	$895

Products highlighted in color were selected for the Short List.
Footnotes: (1) With $40 rebate for registered office users. (2) The promotional price is $99 per copy until the end of the year. CGI=Common Gateway Interface

CHART COMPILED BY JIM BROWN

4 languages, multiple networks, an endless stream of documents and one GP30F to manage the whole operation.



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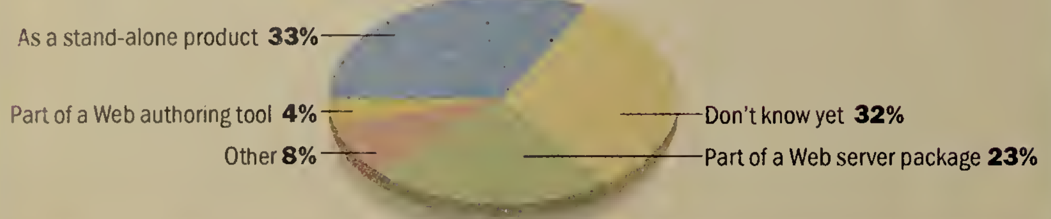
Circle Reader Service #**32**

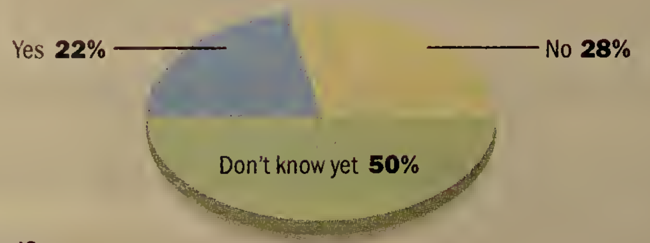
Reader views on Web server management tools

(Based on 100 interviews)

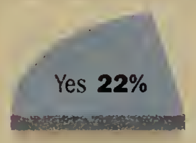
How did or will you purchase a Web server management tool?



Are you happy with the Web server management tools on the market today?



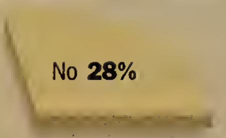
Why did you say that?



"I'm happy with the progress vendors are making in bringing these products out, but the language and standards change so much."

"They're better than a year ago."

"They seem to be evolving rapidly. As soon as a niche opens up, you blink and there's a product to fill it."



"They're all too immature. Web servers don't work that well, so Web server management tools don't tell you enough about what's going on."

"They don't seem complete, and they don't seem easy to use."

"There doesn't seem to be a lot of functionality in the products available today. Nothing integrates with our existing systems management tools."

"They're just not robust enough. They don't do enough things. They're usually slow and cause too much of a load on your server."

"It's too early to say. They don't sound like they're robust enough yet because they're too new."

"I haven't really seen anything that's caused me to want to go out and buy it."

"We need something that works with SNMP but haven't seen it yet."

"I haven't found enough information yet to decide if I'm happy or not."

What Web server management tools, features or functions are most important to you?

"Link management. It's one of the biggest problems. If you want to change a page, who do you affect?"

"Gauging activity level by page. We need to have an idea where everything's going."

"Error reporting such as a problem with a page or a page missing."

"The ability to track who comes into my site. I want the number of visits, not the number of hits because that's a bogus number."

"Capacity planning. I want to make sure we have sufficient capacity to meet future needs and provide service."

"Detecting broken links because they tend to be an area of frustration for customers."

"Finding out the time people spend per visit gives me an indicator of how valuable our information is."

"Link checking. It's easier to have a program go out and do that function than doing it manually."

"Content management is key. We are a large enterprise and we publish a lot of information so keeping content updated can be problematic."

What features or functions need to be added to Web server management tools?

"NOS integration because without it, everything has its own database and we should have only one directory."

"More customization. We need the ability to easily customize and develop Common Gateway Interface scripts."

"Remote administration. Management tools often require you to work on the box you're managing. I would rather be able to manage from home or on the road."

"Integration with systems management because currently nothing integrates with our existing systems management tools."

"Remote management is the only one missing in my world today. With every other client/server technology, you have the ability to manage remotely."

"Better document management."

"Good firewall capabilities for security. If you don't have that, you don't have anything."

"The ability to feed into our network management system because that is how we manage remotely."

The survey was conducted by Focus Data, an independent market research firm in Framingham, Mass., that gathers primary data concerning the enterprise network environments and needs of end users. To purchase full survey results, call Mona Dabbon at (508) 626-2556, or send E-mail to mdabbon@focusdata.ultranet.com.

adjustment so users get a customized "Sorry" message rather than an inelegant "404" response, creating what's being termed a graceful failure.

One feature of Microsoft's FrontPage worth noting is its To Do List, which allows you to make notes about content management tasks and assign them to specific individuals. You can expect to see document management system vendors get into the Web server content management game in the next few years, given that their products address a similar problem.

In fact, a number of content managers already claim to support tried-and-true document management system features. For instance, Inso says its DynaBase supports version control, which makes sure that only the latest page is displayed to site visitors. Both Inso and EveryWare claim to support a check-in/check-out feature, which identifies the last internal Webpage developer to have stored a page into the server, and the person who has most recently retrieved pages from the server for modification.

One thing is clear: The somewhat chaotic picture for Web management tools isn't about to change anytime soon. Truly integrated Web management products are likely a few months off, even though vendors including NetManage, Inc. are promising to deliver all-singing, all-dancing solutions as early as next month.

But give these pioneering vendors credit for seeing the need to supply tools that will help you get started down the right road.

Gibbs is an independent consultant and contributing editor to Network World *and consulting editor to* Intranet Magazine. *He can be reached at (800) 622-1108, Ext. 504, or via the Internet at mgibbs@gibbs. com.*

Check out more info on Web server management:

- **Charts with product details such as Web servers supported, Web server log file formats supported, file management features and file types tracked.**
- **A link to an earlier feature by Mark Gibbs titled "Managing Web madness."**
- **A white paper with advice from the Webmaster/project manager for digital library research and development at the University of California at Berkeley. The Webmaster monitors servers with thousands of files being created and modified by hundreds of individuals.**

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NetworkWorld Short LIST

Web server management tools

The Short List highlights products Network World *recommends you examine when shopping for Web server management tools. Given the youth of this market, the diversity of approaches and the strength of the early contenders, we named to this list products that have shown market stability and offer unique features. Your needs may differ.*

Interse Corp.'s Market Focus 2 is one of the most sophisticated Web server log analyzers out there. Designed to help you justify the value of Web sites, the product pulls information from multiple Web servers, enables you to create customized reports, and comes with a number of sophisticated analysis tools and aids that track exactly what each user did during a visit.

For instance, the package can track each page a visitor has downloaded, tell the order in which pages were downloaded and then attempt to determine how long each page remained on the user's screen. The package can also identify repeat visitors and tell you which browser each visitor used to navigate your site. This can be helpful in determining whether to expend more or less effort building applications that take advantage of a specific browser's functions.

Microsoft Corp.'s FrontPage 1.1 is perhaps the most sophisticated content manipulation and management tool available. It really shines when it comes to providing tight integration of a Web document management system with content editors that include the bundled HTML editor and other custom-configured editors. Although designed as a Web site authoring tool, FrontPage nonetheless has some advanced site management features. For instance, the product includes a To Do List feature that enables you to assign personnel to specific management tasks and then track their work until completion.

NetCarta Corp.'s NetCarta WebMapper 1.0 for Windows and **WebMapper 1.1 for Unix** are outstanding in their ability to slice and dice Web site content for detailed analysis. WebMapper outputs a huge range of reports in a variety of formats. Its speed and reporting configurability are impressive. These products also include some nifty site mapping capabilities that enable you to view information about content graphically and let you see how that content has been linked. In addition, the company provides a series of tools, such as free viewing software, that enable you to look at maps of Web sites created using WebMapper in a screen adjacent to your browser. This way you can view the actual site alongside information about the content.

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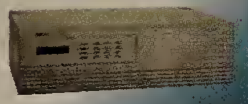

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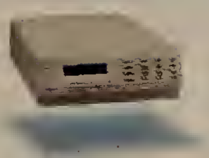

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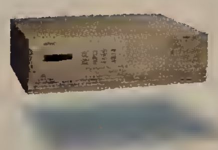

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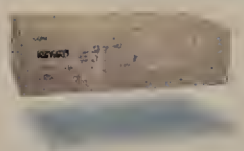

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Circle Reader Service #22

Form is function

FormFlow puts an attractive face on workflow.

By Stuart Melnitsky

If you're trying to sidestep the giant mounds of paper skulking around the office, check out JetForm Corp.'s FormFlow 2.0.

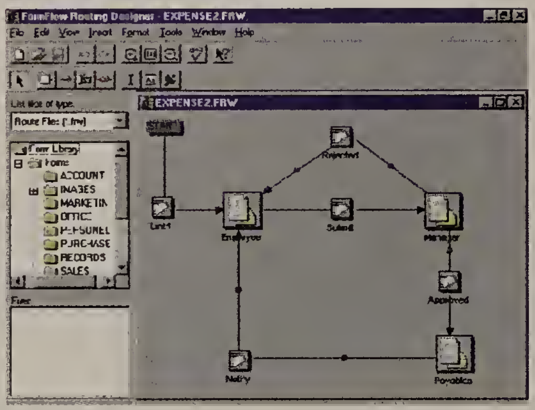
This Windows-based package lets you design a wide variety of single and multipage electronic forms, lets users fill them out and then routes them around the enterprise in a coherent manner. Security features keep sensitive information on particular form fields safe from peering eyes. The package provides tools for passing information between forms and a variety of database formats. FormFlow also embraces the Internet, with built-in support for posting forms on a designated Web site for end users to access and fill out.

We found FormFlow highly effective at automating workflow processes. Its only drawback is a lack of a 32-bit version that runs under Windows 95 or NT, so you may not get 32-bit operating speed in what is a graphics-intensive environment.

FormFlow has five separate modules. Although the Designer and Filler modules, which let you create and fill out forms, are quite formidable, it's the Routing Designer, Security Administrator and Application Designer modules that provide the flexibility to address most workflow requirements.

Routing Designer is a workflow tool that lets you graphically map out and automate enterprisewide forms routing schemes. Within this graphical environment, you specify rules, or conditions, that determine how and when forms will move from one processing stage to another.

Security Administrator maintains passwords for end users, allowing them to encrypt forms and protect selected fields within forms before sending them to other users. Application Designer provides what you need to customize the look and feel of the environment within which users work. You can, for instance, create a uniform interface — a series of toolbars, macros and quick keys — for any of the FormFlow modules.



FormFlow's Routing Designer *can route objects such as this expense reimbursement form through several stages, requiring approval at each one. You can set up a rules-based routing scheme that automatically determines where forms should be sent, based on data that is entered in a designated field.*

FormFlow's routing capabilities rest atop your enterprise messaging system. Supported E-mail systems include Microsoft Corp.'s Mail and Exchange, Lotus Development Corp.'s Notes and cc:Mail, Novell, Inc.'s Message Handling Service and GroupWise, AT&T's Mail Access Plus and Banyan Systems, Inc.'s Intelligent Messaging III.

The package also works with Symantec Corp.'s WinFax facsimile software enabling users running both products to exchange FormFlow forms (but not workflow task routing) via binary file transfers.

A good design

Everything in FormFlow starts with forms design. The flexible Designer offers forms builders a large palette of design elements. It enables you to create single and multipage forms, add bar codes and graphical elements to spice up the design, specify the tabbing order users follow when filling out a form, and establish connections to databases.

Once you've designed a form, you can use FormFlow's workflow capability to send it, along with other attached files, to the people who need it. A basic function built in to the Filler module lets users broadcast a package — a bundle that contains a form, data and perhaps a form application and related graphics — to multiple users in a predetermined order. FormFlow supports broadcasts as well as sequential routing.

If you're looking for greater workflow capabilities, you'll like FormFlow's Routing Designer, which enables you to map and automate routing schemes. You can, for example, create a graphical routing scheme for an expense reimbursement form that passes through several sequential stages, with an approval required at each stage before the form can be sent along. You can even set up a condition that will automatically route the form to an upper manager if the reimbursement request exceeds a certain amount.

Forms get routed to people not necessarily specified by their individual user names, but by their roles. For example, you can create a routing scheme that includes an account manager, a regional supervisor, and a corporate vice president. You can then use a FormFlow database to assign those roles to members of your organization. If and when the people in these roles change, you simply update the database, leaving the routing algorithm untouched.

If an intended recipient can't handle attachments, FormFlow offers an option to send forms as ASCII text strings.

The graphical routing scheme is built around stages and links. Stages represent the points in the routing process at which forms, or packages, are acted upon. Links represent the physical paths taken by forms as they are routed. You fill in the gaps by programming roles into your routing schemes. Roles can be resolved to user names by simple translation to E-mail addresses for sending forms to their next stage, or by more complex operations, such as accessing information from an external database.

When a routing scheme is complete, it is entered into a tracking database, which gets automatically updated as a form moves from stage to stage. This database serves as an audit trail, making it possible to track all FormFlow workflow processes.

The FormFlow administrator can poll this database to identify the initiator of each workflow process, and to check whether specific tasks have been completed, are still in progress, or are in a waiting state. If a bottleneck is spotted, the administrator can delete one or more tasks from the routing scheme. Administrators can monitor all workflow processes, while users can monitor only workflow processes that they initiate or in which they participate.

To really take advantage of FormFlow's capability to create sophisticated forms applications, you need to learn the FormBasic programming language, which replaces the Intelligent Forms Language used in earlier versions of FormFlow. For anyone familiar with Basic, this isn't hard to master.

All in all, FormFlow is a well-rounded client/server package that scales well.

Melnitsky is an independent networking consultant and analyst in Arlington, Mass. He can be reached at sm@world.std.com

For a discussion of what processes workflow can improve and the names of other workflow product vendors, enter the number above in the DocFinder box on the home page.

FIND IT ON FUSION 5201

Network World Fusion
http://www.nwfusion.com

NetResults

Product	**FormFlow 2.0**
Vendor	JetForm Corp. (703) 448-9544 www.jetform.com
Price as tested	$399 for a starter kit with Form Designer, Application Designer and Routing Designer modules, three Security Administrator and three Filler modules, and documentation. Additional Filler modules cost $129 each.
Pros	▲ Robust workflow/management capabilities ▲ Flexible forms designer ▲ Strong database connectivity capabilities
Cons	▼ No 32-bit version for Window 95 or NT

ScoreCard

	FormFlow 2.0
Overall score	**8.3**
Workflow and routing (25%)	9
Designing and using forms (25%)	8
Database connectivity (20%)	8
Security (20%)	8
Installation and documentation (10%)	8

Scores based on a scale of 1–10. Categories are weighted by the percentages shown.

HOW WE DID IT

We installed FormFlow on three 75-MHz Pentium-based workstations running Windows 3.1 or Windows 95, as well as a Nimantics, Inc. 150-MHz Pentium notebook.

We looked at all of the FormFlow components – Designer, Filler, Routing Designer and Application Designer. We assessed FormFlow's ability to create and manage enterprise-wide workflow processes by creating complex multistage routing routines and setting up tracking databases to monitor their progress. As part of our testing, we assessed FormFlow's routing, security and database connectivity capabilities.

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Briefs

■ **ExecuTrain Corp.** *is now offering instructor-led and multimedia-based training and certification testing for* **Microsoft Corp.'s Office 95** *suite of business application software.*

Courseware and testing are available at ExecuTrain centers in Atlanta, Chicago, Des Moines, Iowa, Los Angeles, Miami, Parsippany, N.J., Philadelphia, Phoenix, San Francisco and Seattle. Each exam costs $50.

ExecuTrain also plans to offer a similar arrangement for Microsoft's Office 97 suite when it is released in mid-January.

ExecuTrain: (800) 933-4493.

■ **ReCor Corp.** *has released* **NBT Skills Assessment for Lotus Notes 4,** *a network-based program for evaluating how proficient end users are in interacting with the Lotus Development Corp. product.*

The software puts users in a simulated Notes environment. It can then be used as a pretest to determine how much training a user requires, or to evaluate competency so a customized advanced training program can be designed. Training administrators can use the package to evaluate Notes training programs.

The module can be used with ReCor's NBT for Lotus Notes courses, or it can be used standalone. The product runs on any LAN that supports Microsoft Corp. Windows 3.1 or 95 clients outfitted with 80486 66-MHz processors and VGA color monitors. A network server license for 10 concurrent users is priced at $595, and a corporate site license for 250 users is priced at $1,360.

ReCor: (800) 467-3304.

■ **Global Knowledge Network, Inc.,** *a Waltham, Mass.-based training company, recently acquired* **MWI Training Services, Inc.**

The acquisition enables Global Knowledge Network to expand into two new markets by taking over MWI facilities in Baltimore and Pittsburgh.

Global Knowledge: (617) 893-8600.

Some common sense about reengineering

As you prepare to turn a process on its ear, don't follow the same path as other companies and ignore the obvious.

By James Carlini

When you're ready to reengineer a process, don't toss aside your common sense along with the outdated modes of thinking that you're trying to replace. To do so could set you up to face larger problems down the road or even force you to return to square one.

SOME COMMON SENSE REENGINEERING DOS AND DON'TS

Do

- ▶ Ask for feedback and criticism from everyone on staff. It's the only way you will get to a sound decision.
- ▶ Create a positive environment for change.
- ▶ Manage by walking around the organization to see first-hand how things are done and how they can be improved.
- ▶ Pay attention to change management.
- ▶ Spread recognition to everyone who worked on the project when reengineering is successful.

Don't

- ▶ Lose site of the objectives you have set.
- ▶ Be afraid to admit to a mistake and correct it as quickly as possible.
- ▶ Dismiss loyal employees, whose positions are no longer needed, as if they've done something wrong.
- ▶ Assume customers will tolerate your management shortcomings if your company's service levels fall.

As simple as it sounds, this advice bears repeating when you consider how many people abandon their common sense in reengineering efforts. Just look at what happened to some of the regional Bell operating companies that ignored common sense rules of thumb in their rush to reap reengineering's benefits.

For instance, common sense tells you to establish a way of measuring success for your new process before you implement it and to create a backup plan just in case the new process fails. But both NYNEX Corp. and Ameritech Corp. suffered setbacks when they reengineered their customer service organizations without a proper way to gauge how things were going.

In fact, it took a fine from the public utilities commissions (PUC) that oversee the companies to open their eyes. The PUCs took action only after receiving numerous calls from irate customers, something the two companies should have been doing on their own.

Common sense also tells you that if your reengineering effort results in having to let people go, you should do it with class and do it all at once. The people who stay behind are more likely to remain loyal knowing that layoffs, however painful, were handled tactfully and amounted to a one-shot deal.

If you cut staff in phases, people won't know if or when they may get a pink slip. As a result, morale, productivity and trust will all take a nosedive.

Bell Atlantic Corp. had problems with reengineering and downsizing that caused irreparable damage to employee morale. Information systems staff were asked to take reassignments to new locations to avoid layoffs. A number of workers who accepted the transfers and the added time to their commutes were eventually laid off anyway. It will be interesting to see how the company puts the pieces back together again, especially as it merges with NYNEX.

Avoiding autocratic thinking

There is more common sense in vigorously questioning any executive with the mindset of "He who has the gold, makes the rules." This type of autocratic thinking goes against the grain of reengineering.

Yet regional Bell operating company chief executives got the "emperor has no clothes" treatment from their senior subordinates who did not want to risk their jobs by pointing out the fallacies of a proposed reengineering strategy. Those that spoke up were quickly ostracized and banished from the RBOC kingdom.

Also keep in mind that reengineering does not equate to automatic success and productivity gains. You have to make sure there are adequate resources to maintain the new process and not just enough to get you through the transition stage.

At Ameritech, where downsizing, reengineering, breakthough strategies and other buzzwords abounded, the quiet trend now is to put the organization back to where it was around 1993, just before most of its downsizing and bloodletting occurred.

Ameritech found out the hard way that the bold managerial steps it said would move the company forward resulted in nothing more than eventually falling backward.

Major customers recently surveyed by Carlini & Associates, Inc. about the quality of their local service complained about the lack of technical skills in new installers. Some plainly requested that their RBOC bring back a person who knows how to do the job. Installation dates as well as repair intervals have become outrageous.

One telecommunications director at a multibillion-dollar company who asked not to be identified flatly told his Ameritech account manager, "If I had a choice today, you guys would be out of here tomorrow."

To understand that manager's feelings, consider what happened in Ameritech's customer service call center where you could wait 45 minutes to an hour for someone to take your call. This was a fiasco created by someone brought in from another industry who thought the company didn't need as many people to answer service calls.

In meetings and focus groups with various customers across several states, complaints and criticism are open and blunt. The way some RBOCs have reengineered customer service into the ground has not been a positive endeavor.

Now Ameritech is quietly bringing back retirees to the jobs out of which they were reengineered out.

For instance, the downsizing and consolidation in the call center is being reversed as Ameritech seeks to hire hundreds more people to augment the staff. The company is also now doing customer focus groups to gauge its service levels but has been unusually quiet about the results.

If results were good, you can bet Ameritech would be touting them loudly.

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Link to more info on successful reengineering.

- ● **A pair of articles with helpful hints on running your organization while instituting major changes to the way work gets done.**
- ● **A series of articles that identify some common reengineering pitfalls.**
- ● **The BPR Online Learning Center Web site, which is maintained by ProSci, a management consulting firm. The site includes a series of interactive tutorials on various reengineering topics.**

Enter the number above in the DocFinder box on the home page.

http://www.nwfusion.com

The best common sense approach of all is to learn from others' mistakes before you recreate them yourself. Based on what happened in the RBOCs, you should make more effort to plan your reengineering developments and analyze their expected outcomes upfront before committing to strategic directions. Remember, customers, competitors and everyone else are watching. If you do a good job, it will pay dividends. If you don't, you will pay dearly.

Carlini is president of Carlini & Associates, an international management consulting firm in Hinsdale, Ill. He can be reached at (630) 986-1888 or carlini@nwu.edu.

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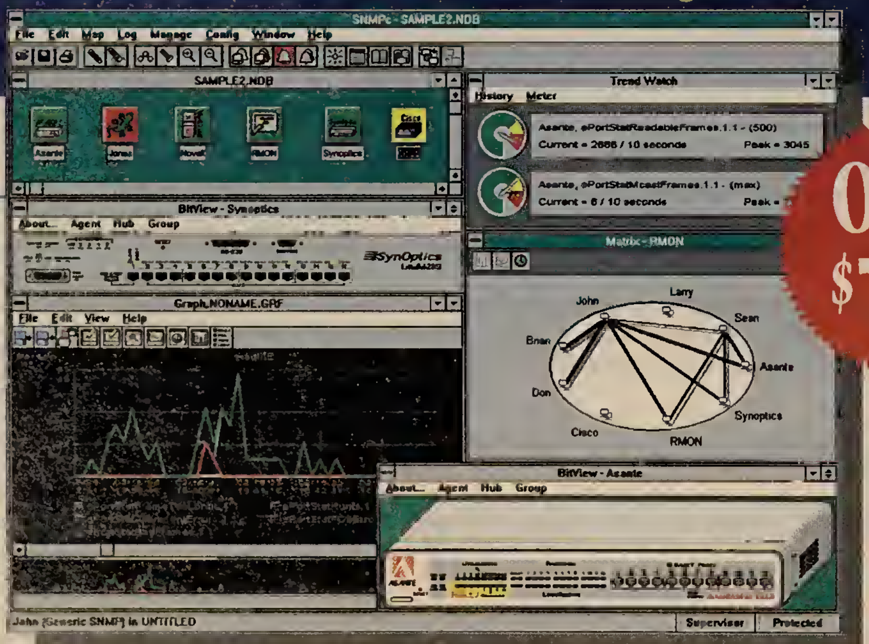

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Express WorkGroup Switching Hub Bundle gives servers dedicated 100Mbps bandwidth, moving clients to 100Mbps with Intel Hubs and Adapters, ond a downlink module to connect to existing 10Mbps LANs. The WorkGroup Solution includes:

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INTEL

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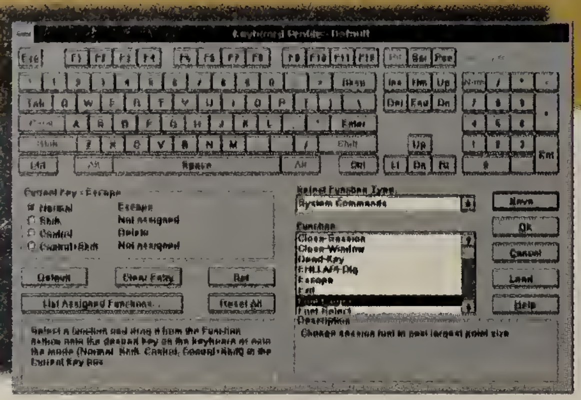

Keyboard Profile - Default

Current Key - Escape

● Normal Escape

○ Shift Not assigned

○ Control Delete

○ Control+Shift Not assigned

Select Function Type: System Commands

Function: Close-Session, Close-Window, Dead-Key, EHLLAPI-Dlg, Escape, Exit, Font Select

Description: Change session font to next largest point size

Select a function and drag it from the Function listbox onto the desired key on the keyboard or onto the mode (Normal, Shift, Control, Control+Shift) in the Current Key box

Highlights:

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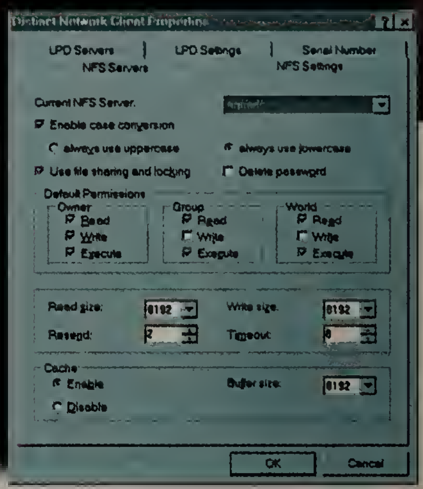

Distinct Network Client Properties

Current NFS Server:

☑ Enable case conversion

○ always use uppercase ● always use lowercase

☑ Use file sharing and locking ☐ Delete password

Default Permissions

Owner: ☑ Read ☑ Write ☑ Execute

Group: ☑ Read ☐ Write ☑ Execute

World: ☑ Read ☐ Write ☑ Execute

Read size: 8192 Write size: 8192

Resend: 2 Timeout: 8

Cache: ● Enable ○ Disable Buffer size: 8192

Highlights:

- Integrates seamlessly into Windows 95
- Mounts NFS drives from Explorer or Network Neighborhood
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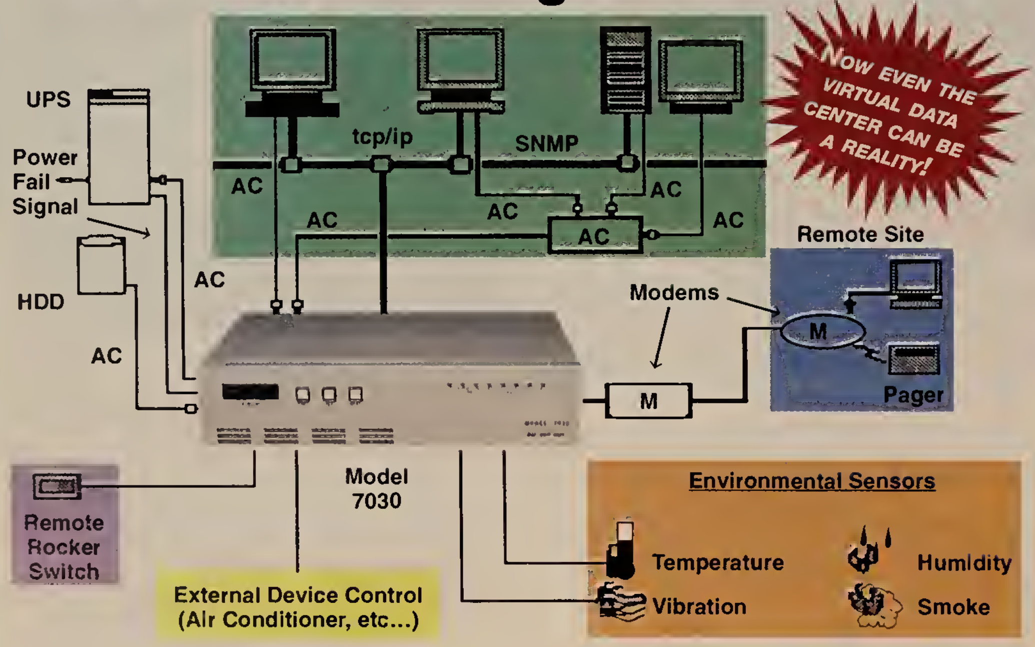

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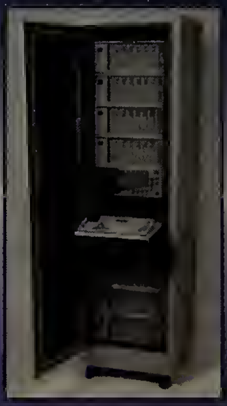

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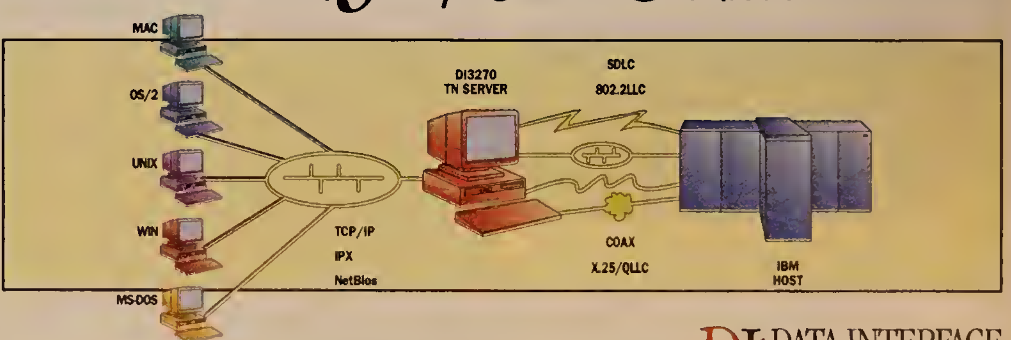

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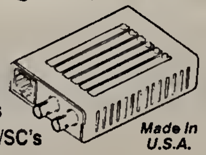

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UUNET

Continued from page 1

were not available, observers said it will probably be a combination firewall and router.

Extranets take intranets to a new level, opening private Webs to outsiders while maintaining a high level of security, said Alan Taffel, vice president of marketing and business development at UUNET. "Extranet services will provide users with the economies of the Internet, [quality of service], end-to-end security and remote access support that has not been available before," he said.

The company is believed to be the first ISP to roll out an extranet service, but others are sure to follow in light of customer demand.

UUNET's *Taffel*

An extranet service makes sense from a business standpoint, "especially in the automotive industry, where we have such close relationships with our suppliers," said Sim Wright, information technology coordinator at BMW Manufacturing Corp. in Greer, S.C. The only reason BMW is not offering outside companies access to its intranet service is security, he said.

UUNET's extranet service will let network managers more closely monitor their extranet, intranet and Internet traffic using a device that will be deployed at the customer premises. The service provider will offer its customers guarantees that extend beyond the simple availability of a connection.

UUNET's service will be designed to ensure that increased traffic levels due to the allowance of business partners and others on a customer's private Web will not hamper response time. The company has developed quality of service (QoS) technology that will let network managers prioritize traffic based on various parameters.

One problem customers are running into today is that traffic transmitted from a service provider's network operating center is transmitted as pings.

Routers deployed on the edge of a customer's network automatically give ping traffic the lowest priority, whereas other data traffic is most likely given top priority, Taffel said.

Prioritizing access to its extranet could be an important business tool for a company trying to provide key business partners with special attention, said Chris Stevens, an analyst at Aberdeen Group, Inc. in Boston.

UUNET has business relationships with Ascend Communications, Inc., Cisco Systems, Inc. and Cascade Communications Corp., Stevens said. Any of those players could supply a product that would integrate QoS network management — and access — rich features, he said.

UUNET's extranet service will let network managers more closely monitor their extranet, intranet and Internet traffic using a device that will be available at the customer premises.

Another benefit of UUNET's service is expected to be better management of remote workers through the elimination of large modem banks, Taffel said. Remote end users instead will be able to access their company's network using UUNET's extranet service.

ISPs' customers are looking for a way to extend the reach of their intranets, but security is a big concern for most of them, said Craig Johnson, principal analyst at Current-Analysis, a Herndon, Va.-based consultancy. Once security is addressed, extranets will let users leverage their existing WAN services, such as frame relay and ATM, he added.

"This is the way to go for us," said Peter Eisner, president at NewsCom Service, Inc., a Coral Gables, Fla.-based news service company. NewsCom is just looking into setting up its own intranet, but if the company could get better guarantees and a higher degree of security with an extranet service, it would look into the offering, he said. ■

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Oracle

Continued from page 1

stored procedure. In theory, such a standard would allow any applet to invoke a Java stored procedure — the business application logic executed during a database search — across the Internet without having to know specifically what back-end database was involved.

According to Tom McGinn, Sun Microsystems, Inc.'s Java education specialist, this would be a boon.

Java applet developers would not have to know different stored procedure strings and could presume each database across the Internet worked with the same calls.

McGinn pointed out that Sun has one database standard, called Java Database Connectivity (JDBC), but it only defines how to access a database, not how to perform complex searches across relational databases.

To conduct a business logic search, such as a "what if" or "then else" query, across an Oracle relational database today requires the use of Oracle's proprietary SQL extension, called Procedural Language SQL (PL/SQL).

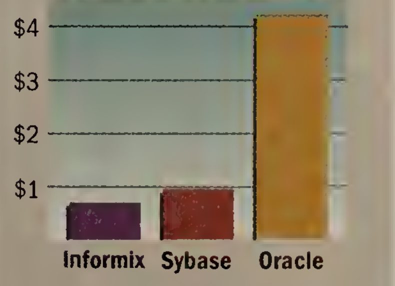
Sources at Oracle said PL/SQL is not going away and will be a part of Oracle Version 8.0 next year.

But Oracle's Java Stored Procedure will be offered as an alternative to developers as an extension to PL/SQL.

"From the Web perspective, we're allowing our Web server to talk to the relational database," said one source at Oracle, confirming that Oracle is discussing with Sun the prospect of making its Java stored procedure a Java standard.

ORACLE LEADS DATABASE PACK IN REVENUES

(In billions)



Revenues are for the year ending Dec. 31, 1995. (Except for Oracle's numbers, which are for its 1996 fiscal year, ended May 31.)

Tom Stepien, vice president of database marketing at Sybase, said it may be too early to talk about standards in this area, although Sybase is ready to work with Sun.

Mike Olson, director of Informix's Datablades division, said the beta version of the Informix Universal Server, scheduled to ship Dec. 30, includes a way to write stored procedures in Java.

"If there were a Java standard for this, we'd support it," Olson said.

Janet Perna, IBM's general manager for data management solutions, said the next version of IBM's DB2, available as of Nov. 29, lets developers write stored procedures in Java and also incorporate the JDBC data access interface.

Currently, developers have to use BASIC or C to write stored procedures.

"One result of these additions will be the ability for application developers to work entirely with a pure Java programming environment," Perna said.

"The applets they write can communicate with the database via Java calls, and execute Java logic on the database," she said.

Alan Dray, Web site database developer at Eastman Kodak Co. welcomes the move by Oracle and other database vendors to implement Java stored procedures.

He said he hoped industry-standard code would emerge for the sake of interoperability. ■

Microsoft

Continued from page 1

time for anything as frivolous as a family life.

Has all that changed with age? Are older Microsoft employees wising up, and looking to cash in on their stock options and indulge in the good life? Are they entering the era of "that's good enough," as some critics believe?

According to many longtime Microsoft employees, the answer is a resounding no.

Former company President Jon Shirley, who was instrumental in shaping Microsoft during the '80s and retired in 1990 at the age of 51, reportedly told employees, "Microsoft. . .it's not a job; it's an addiction." Longtime execs agree.

"[Aging has meant] more maturity and perspective, but still [maintaining] an intensity that is unparalleled," says Steve Ballmer, executive vice president and a 16-year veteran of the company. The forever-intense Ballmer celebrated his 40th birthday this year.

Keeping the pace

"We have matured and are taking our relationship with the community more seriously," says Greg Lobdell, group product manager for Exchange. But "the passion is as strong now as when I started in 1983."

The 36-year-old Lobdell says his hours per week have actually increased. "It's just that the technology has advanced so that I can fit more [work in] in a flexible fashion."

Rich Tong, who was recently promoted to vice president of the Desktop and Business Systems Division, says he is amazed at how little the corporate culture has changed in the eight years he has been at the company. "Microsoft has grown laterally, and this has allowed us to stay like a start-up," Tong says.

Employees say this flat organizational structure has allowed Microsoft to maintain the sense of autonomy among employees it has had since its infancy.

"There are no rules here," says Chris Peters, vice president of the Vermeer Product Unit and the driving force behind such products as Microsoft Word and Microsoft Office. Peters, 38, has been at the company for 15 years. "There have never been any rules, hours or anything. You're really supposed to manage your own time."

This means lots of time for work, mixed with time off for play.

"If you want to go to your kid's baseball game, you just do it," Peters says. "There are no three levels of management to go through."

The bottom line for company veterans such as Ballmer, Lobdell, Tong and Peters is the ability to balance home and work.

Dialing in

As more Microsoft employees start having families, they have had to figure out ways to juggle both sides of their lives — personal and professional. For many, this has meant gaining flexibility by working from home.

While the company does not provide workers with home computers, Peters says the software is free and readily available, as are connections into the company.

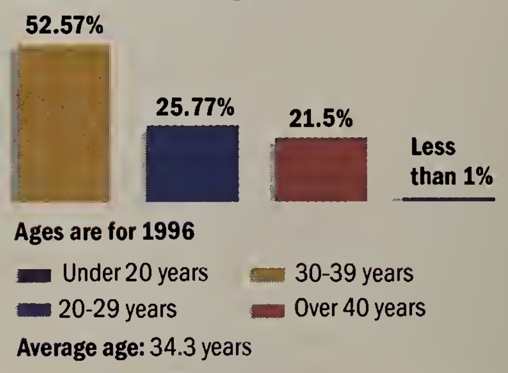
"You can get ISDN lines or normal modem lines," Peters says. "Anybody that wants them can get them."

Bill Gates is already in on the dial-in action. Though Gates was unavailable for comment, in his *New York Times* syndicated column, he wrote, "I spend less time in the office than I used to, partly because I have a family now, but more because electronic mail has freed me to work at home in the evenings and on weekends."

Ballmer, the father of two children, says he has to balance his home and work life carefully. "My family is Priority 1, but I love my work and Microsoft, and give most of my time to one or the other," he says. "It helps to be able to work more easily at home."

THIRTY-SOMETHING

Within the past decade, Microsoft employees have changed from a bunch of 20-somethings to a bunch of 30-somethings.



SOURCE: MICROSOFT, REDMOND, WASH.

Tong, who is 35 and the father of a two-year-old and has a second child on the way, opted for an ISDN line into his home. He says this helps him have both a work and home life.

For Lobdell, who was the first in his product group to get married, the balancing act begins early in the morning. The father of four children, all under the age of 10, Lobdell works around his family's schedule.

"I am a morning person, so very often I'll get up early — for instance, this morning at 4 a.m. — and work from home on E-mail and other projects," Lobdell says. "I get three work hours in and am there when the kids get up and get ready for school."

Lobdell says Microsoft encourages remote access, which has been a huge benefit to him. "If there's a ballet recital, music lesson or soccer practice I can help with, [it may mean] leaving at 5:00, but then I [dial in] after the kids go to bed," he says.

Remote access is also consistent with the company's motto, "Work smarter," according to employees.

"I can get through 1,200 [E-mail] messages [on a flight] between Seattle and Boston," Lobdell says. He adds, though, that sometimes his family has to understand a product cycle, and when the push is on to get the product out the door, he might be less available. "I saw [Senior Vice President] Jim Allchin more in the months before the Exchange launch than I did my spouse," Lobdell says.

> *"We have matured and are taking our relationship with the community more seriously. But the passion is as strong now as when I started in 1983," Microsoft's Lobdell said.*

Marriage and the baby carriage

Marriage at Microsoft seems to be more of a common occurrence than it was when many of the current executives started.

In 1994, Gates married Melinda French, a Microsoft manager. Just this year, they had their first child.

Both Peters and Ballmer married women from Waggener Edstrom, Microsoft's public relations firm.

"[You have] common interests with people your own age who are smart and successful," Peters says. "In a way, you're using the Microsoft interview process for your own gain. Remember, you're getting the top people in the country coming here."

Moving on

In the past 20 years, Gates has seen many of his closest friends and advisers move on or, in at least one case, pass away. Perhaps the most concrete example of this is the original office of the president.

Having fired President Michael Hallman in a reorganization, Gates created this executive branch in 1992 and distributed some of his responsibilities among a trio of friends and Microsoft executives — Mike Maples, Frank Gaudette and Ballmer. Of this team, only Ballmer remains at the company.

Mike Maples, former executive vice president of the Worldwide Products Group, retired in July 1995 at the age of 52. He had been at Microsoft for seven years.

Frank Gaudette, who led Microsoft into the public

The graying of Gates

Having aged two decades at Microsoft Corp., Bill Gates seems to be everyone's favorite choice for biggest change at the company. From Albuquerque to Redmond, and from his clothes to his hygiene to his work habits, it seems Gates has undergone quite a makeover. Here are some longtime Microsoft watchers' opinions:

Jim Wallace, coauthor of *Hard Drive: Bill Gates and the Making of the Microsoft Empire*: "There is this incredible transformation from Bill Gates wearing a T-shirt with pizza stains to a guy who does dress up in suits, and who goes to China and meets with the Chinese president. I refer to him as Citizen Gates. He conducts foreign policy, he plays golf with the President, he meets with heads of state. He could not be the impertinent brat he used to be and travel in the circles he does. He's on the world stage. That person is certainly different than even 10 years ago."

Douglas Coupland, author of *Microserfs*, a book about life among Microsoft programmers: "His image is polished now, which is normal, as he's in his 40s and the dandruff thing gets tired soon enough. He also seems more comfortable with his iconic role than before. When I was in Europe last year, I asked Europeans who was the most American person, and they all said Bill Gates. He's replaced John Wayne and John F. Kennedy in the foreign mind."

Paul Andrews, coauthor of *Gates*, a biography of the Microsoft founder: "The big change in Gates is how much more cosmopolitan he is today than he used to be. He's still got his nerdy exterior. But you see him on the cover of *Wired* and *Forbes*, he's at the opening of Planet Hollywood in Seattle, he's watching the Sonics and Bulls play, then he's in the news for being the richest guy."

—*Sandra Gittlen*

The original Microserfs: *A young Gates and the Albuquerque group in 1978.*

domain by heading its initial public offering in 1986, and later became chief financial officer, died of cancer in April 1993 at the age of 57.

Enjoying the good life

Because of the steadily rising stock prices, many veteran employees are now millionaires. Some are even billionaires. This has led some to indulge in the good life, buying nice homes and fancy cars. For others, it has given them pause to sit back and relax.

“Aging [at Microsoft] means that management values luxury more than excitement,” says Thomas Nolle, president of the CIMI Corp. consultancy in Voorhees, N.J.

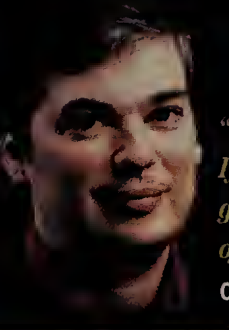
STRIKING A BALANCE

“I find that the flexibility at Microsoft enables me to spend quality time at home while staying as intense as always.”

Greg Lobdell, group product manager of Exchange

“Now when [Microsoft employees] go out, we all have kids, so we don’t have to talk about work.”

Rich Tong, vice president of the Desktop and Business Systems division



“There are no rules here, hours or anything. If you want to go to your kid’s baseball game, you just do it. There’s no three levels of management to go through.”

Chris Peters, vice president of Vermeer product unit

“Executives are saying, ‘What I want to do is go home and spend the weekend with my kids,’ ” Nolle says. He says this means they are less willing to get into something that would have the phone ringing off the hook on the weekends.

Even Gates, a notorious workaholic, admitted in his *New York Times* column to taking some time out to relax and enjoy his family. “I used to work all night in the office, but it’s been quite awhile since I lived on catnaps,” he wrote.

“I like to get seven hours of sleep a night because that’s what I need to stay sharp and creative and upbeat. I envy people who thrive on three or four hours of sleep a night. They have so much more time to work, learn and play,” he wrote.

He added, “Because there aren’t enough hours in the day, it’s tempting to try to do two things at once. Right now, I’m perfecting reading a newspaper and riding an exercise bike at the same time — a very practical form of multitasking.”

Peters says most people at Microsoft did not come in expecting to be millionaires. “Most people here are not necessarily well-rounded people. They are computer geeks. They like playing with computers,” he says. “People get the money as a side effect; it’s not part of their personality.”

He also claims that the homogeny of the company has only fueled the perception of the aging process. “Everybody’s now 28 to 35. They all buy their first houses. It’s more the wierdness of being the same age,” he says.

It is exactly this metamorphosis of the aging computer nerd that Douglas Coupland wrote about in his best-selling book *Microserfs.*

“There’s this eerie, science-fiction lack of anyone who doesn’t look exactly 31.2 [the average is now 34.3, according to Microsoft] on the campus. It’s oppressive. . . Microserfs are locked by nature into doing 31.2-ish things: the first house, the first marriage, the ‘where-am-I-going?’ crisis, the out-goes-the-Miata/in-comes-the-minivan thing,” Coupland wrote.

But this trend toward family is a far cry from how some people remember Gates and Microsoft.

“I was there once, and they had all the kids there for a picnic on Father’s Day,” says Eric Schultz, chairman and chief executive officer of MESA Group in Newton, Mass. “The kids came, had the picnic and then left, and the fathers stayed and worked.”

This type of insensitivity toward family occasions was not uncommon, according to other Microsoft watchers, who recall similar events.

“Gates had scheduled a meeting on Mother’s Day,” says James Wallace, coauthor of *Hard Drive: The Making of the Microsoft Empire.* “It never occurred to him that some executives would want to spend that [Sunday] with their mothers.”

In 1992, *Bill Gates created the Office of the President, comprised of Mike Maples, Frank Gaudette and Steve Ballmer, to balance the executive power at Microsoft. Four years later, only Ballmer remains at the company.*

Much of that single-mindedness remains.

“Steve Ballmer’s having a family hasn’t diminished his intensity,” Wallace says. “That doesn’t mean that he isn’t giving time and attention to his wife and kids. But the fundamental character hasn’t changed. He wants to win. He wants to beat his competitors.”

Nor has money slowed Ballmer down. *Forbes* magazine estimates Ballmer’s net worth at a whopping $3.7 billion.

Fountain of youth

Analysts and Microsoft watchers alike say Netscape Communications Corp. and the Internet were just what Microsoft needed to rejuvenate.

“They weren’t sound asleep, but certainly they were daydreaming,” Wallace says of Microsoft’s reaction to the Internet craze.

Much like the U.S. used the image of the Soviet Union as the enemy to keep patriotism alive during the Cold War, Microsoft is using the image of Netscape and other upstarts to rally employees.

“We’re best when we’re focused, and we’re certainly focused,” Peters says.

Much of the drive comes from the top. “People need something to believe in,” MESA Group’s Schultz says. “World domination by Microsoft and Bill Gates give them that.”

But some critics say Microsoft has a much bigger demon to face: its own conservatism. “As Microsoft ages, the downside [of losing the market] begins to look more frightening,” CIMI’s Nolle says.

“When you’re an underdog, you take risks,” he adds. “They’re no longer the underdogs.”

Microsoft is indeed entering the era of “that’s good enough,” Nolle says. “If they continue to hug the middle of the road, they will become like IBM — fabulous executors, but mediocre innovators. The market will pass them by.”

Hard-working Microsoft execs couldn’t disagree more.

“We’re actually becoming more efficient,” Tong says. “We’re lucky because we have all the attributes of a start-up . . . but the difference is that there is an ability at Microsoft to make a mistake and not be put out of business for it.” ■

Life among the Microserfs

In his 1995 best-seller, *Microserfs,* author Douglas Coupland — best known for the definitive *Generation X* — wrote about life among the 20-something Microsoft programmers. *Network World*’s Sandra Gittlen had the chance to chat with Coupland via, of course, E-mail.

As management grows older, do you see it affecting the company and corporate culture? In what way: positively or negatively?

It would have to. I don’t know if it’s something that’s as binary as positive/negative. With age comes wisdom, but complacency, too.

In *Microserfs,* you mention more than once the average age of employees. Do you think age plays a significant role in the hiring of programmers?

No. Microsoft only cares about skills. Skill, skill, skill. It doesn’t matter how old or young you are. The fact that the average age there was 31.2 a few years ago — probably around 34-ish now — reflects only the fact that people with desired skill sets were of a certain age at a certain time.

In the book, you dwell on the fact that the environment is exhausting. In doing your research, did you find that a lot of the programmers were burning out and needed to move on?

There was some burnout — at Microsoft and everywhere else — but it was more a crisis of the psyche that I noted in the 30- to 35-year-olds: ‘Who am I?’ ‘What is my life?’ ‘Where do we locate meaning?’

Did a lot of people end up either starting their own companies or just getting out altogether?

People dream of ‘getting out,’ but when they try — and many, many do — they go nuts with boredom. Just nuts. Soon enough, they’re back in the game. Much case experience has shown me that people who got out of the tech monoliths like Microsoft, Intel and so forth prefer to go into either consulting or smaller start-ups. I don’t think it’s for the money, either — although, like Lana Turner in a sweater at Schwabbs, having one’s company’s IPO get discovered is a large tech industry daydream — but it’s simply that they’re tired of meetings and hierarchy. They’re adults now. They’d rather make decisions solo.

Does anything about Microsoft’s product strategy suggest maturity or growth?

More people, more products, more history. Maturity isn’t maturity until viewed from the point of decline, and Microsoft is certainly in no decline.

Growth? I imagine they’re growing. They seem to be branching out into everything. That seems very growth-ish.

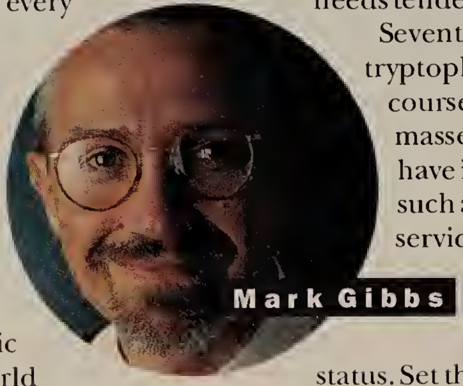
Gibbs Institute's first Thanksgiving Golden Turkey Award

Good morning, ladies and gentlemen, and welcome to the Gibbs Institute's First Thanksgiving Golden Turkey Award.

In our industry, we have a novel combination of hype, hyperbole, misrepresentation, obfuscation, innuendo and downright silliness hanging on to the coattails of the most important business and cultural transformation in the history of business.

At this prestigious ceremony, our virtual panel picks on, er, excuse me, nominates those individuals, companies or entities that don't, won't or can't come to grips with the computer industry and its consequences because of their blindness, self-imposed ignorance, thinly veiled political agenda or blatant desire to return us to the Dark Ages.

And what a year it's been. We've got contenders coming out of every nook and cranny.


Mark Gibbs

Our first feathered-and-ready-for-the-chop nominee is good ol' IBM. Yes sir, IBM is still the revenue giant of the industry and still doesn't get it. Although the company has revenue that exceeds the gross domestic product of many third-world nations, its PC hardware and software divisions still can't figure out what the word "marketing" means.

Our second gobbler is the group of the large publishers and other parties with vested interests that are pushing the Treaty on Intellectual Property in Respect of Databases to the World Intellectual Property Organization (see last week's column for more details). This might look like a young bird, but it is old and could leave a bad taste in our mouths.

Plump and juicy, oven-ready and third on our list are all vendors that don't declare their policy on how many dead or incorrectly operating pixels are acceptable on their active matrix displays. Get out the cranberry.

Our fourth bird, America's Carriers Telecommunications Association, is prebasted. It's arrogant attempt to get the FCC to legislate against Internet telephony products was plain stupid. If they win this contest, we'll let the Voice on the 'Net Coalition (www.von.org) season the stuffing.

> *Plump and juicy, and third on our list are the vendors that don't declare their pixel policy.*

Fifth on the chopping block is the FCC. The panel felt that an explanation for their nomination was superfluous, so moving right along...

Probably a little scrawny all but the smallest family, there's our sixth avian imposter: Cyber Promotions, Inc. and its president, Sanford Wallace. For a while, this outfit raised junk E-mail (aka spamming) from an art form practiced by the truly lame on Usenet to a business that irritated most of the online world. Now more or less out of business, this one still needs tenderizing with a brick.

Seventh in our parade of tryptophane-loaded main courses are the telcos en masse (as the French would have it) for making ISDN such an overpriced, underserviced mess. Trying to kill what could have been a golden goose sure qualifies for turkey status. Set the oven to 375 degrees.

And last but not beast (sorry, foul joke) comes our eighth contestant: that sorry mess called the Communications Decency Act. That's another one that needs no explanation, just a fast decapitation with the axe. Oops, my mistake — it never had a head in the first place.

And now, the moment of truth, the point of decision, the pivotal moment, the. . .sorry, I got carried away.

And the winner is (fumble, rustle, rip). . .a surprise nominee: the Clinton administration. For their unflagging efforts to pay only lip service to electronic commerce, information technology and the computer business in general, without doing anything that could be considered practical, the Gibbs Institute awards Bill, Al and the folks in power this year's Golden Turkey Award.

OK, let's start stuffing — this is one huge bird. And how are we going to find an oven big enough to cook it?

Please send serving suggestions to mgibbs@gibbs.com, or call me at (800) 622-1108, Ext. 504.

A premature death for ISDN is a crazy way to serve users

The plight of ISDN reminds me of the recent presidential election: Except for a minority of hard-core enthusiasts, hardly anyone cared about the outcome.

ISDN is actually having more trouble attracting mind share than the Republican and Democratic candidates. Major-party candidates were the only perceived options for most voters. ISDN, on the other hand, is in jeopardy of falling off the ballot and heading for the big graveyard of technology has-beens.

Dave Buerger

"So what?" some of you may say. ISDN's 128K bit/sec dial-up speed for accessing the Internet and other services is slow compared to alternatives. Cable modems and data switching line technology are examples of newer, faster technology poised to push ISDN aside.

If that's what you believe, you're in for a rude surprise. These newer products require infrastructure upgrades. You've gone mental if you think phone and cable companies have suddenly turned a new leaf. History suggests it will be years before faster services are widely available at a good price.

> *You've gone mental if you think phone and cable companies have suddenly turned a new leaf.*

Speaking of history, this is the fourth anniversary of National ISDN's flamboyant debut. Unlike most celebrations, the big news about this milestone is that the bulk of ISDN support has flamed out.

ISDN's chief public relations arm was the Corporation for Open Systems International (COS). This organization sponsored events such as a huge annual exhibit at Comdex and conducted market research to measure ISDN adoption rates. Well, COS is dead. It was funded mainly by telephone companies, which pulled the financial plug this year.

Last November, Bellcore reported the national installed base of ISDN lines was about one million, up from 300,000 in 1994. Bellcore also said there were about 114 million total access lines, more than two-thirds of which were capable of supporting ISDN. Bellcore can no longer update these numbers because the regional Bells won't pay for the research.

(In case you wondered, Bellcore said that cajoling and collating data from the Bells required two full-time staffers.)

Are you starting to see a pattern here?

The only uniform thing about ISDN is that it is a mess. Some Bells are more progressive than others, but monthly charges, installation fees, usage fees and availability are more confusing than President Clinton's track record on fulfilling campaign promises.

ISDN is touted as a terrific way to speed Internet access. So I checked with leading Internet service providers to see what percentage of their subscribers use ISDN. The results were a joke.

I used C/Net's, an online publication, online guide to ISPs, which ranked reader evaluations of 463 providers (see www.cnet.com). Of the top 10 providers, only half offer dial-up ISDN access. Of those that do, only 1% of their subscribers use ISDN.

For all the talk hyping high-speed Internet access, it's clear that practically no one is using it.

Pacific Bell is the only RBOC that seem's committed to making ISDN pervasive. At Comdex, Pacific Bell announced ISDN Internet and Work@Home. This $500 product includes an ISDN terminal adapter from 3Com Corp. and promises easy use of ISDN. Pacific Bell will charge a flat rate of $50 per month.

The interesting thing is that Pacific Bell sees ISDN as a profit-making opportunity. The company said its motivation to promote ISDN stems from moving Internet users off below-cost, flat-rate dial-up lines onto profitable ISDN lines.

That's a mind-set that all ISDN providers should consider. Phone companies need to rethink priorities about high-speed services. ISDN is today's only pervasive, fast dial-up service option, and will remain so for years.

This is not the time to kill ISDN marketing. Boosting ISDN's awareness and simplifying availability is the best way to truly serve customers.

Buerger is a networking industry consultant and writer in Atlanta. He can be reached at dave@buerger.com.

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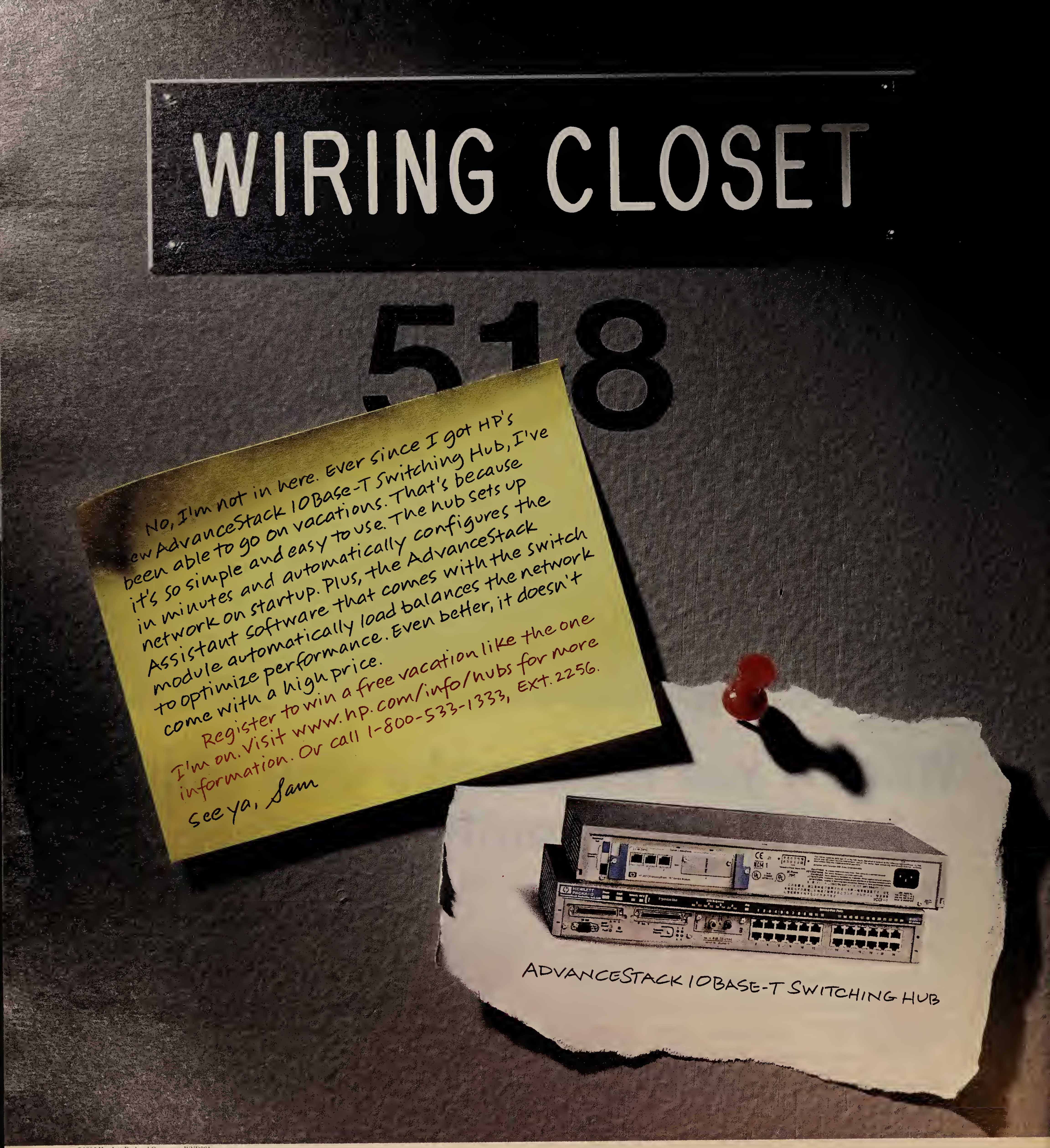

No, I'm not in here. Ever since I got HP's ew AdvanceStack 10Base-T Switching Hub, I've been able to go on vacations. That's because it's so simple and easy to use. The hub sets up in minutes and automatically configures the network on startup. Plus, the AdvanceStack Assistant software that comes with the switch module automatically load balances the network to optimize performance. Even better, it doesn't come with a high price.

Register to win a free vacation like the one I'm on. Visit www.hp.com/info/hubs for more information. Or call 1-800-533-1333, Ext. 2256.

See ya, Sam

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*____________

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:
1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*____________

3 What is the estimated value of networking equipment and services that you help specify, recommend or approve? (check one only)

01. ☐ $100 million or more
02. ☐ $50 mil. - $99.9 mil.
03. ☐ $25 mil. - $49.9 mil.
04. ☐ $20 mil. - $24.9 mil.
05. ☐ $10 mil. - $19.9 mil.
06. ☐ $5 mil. - $9.9 mil.
07. ☐ $1 mil. - $4.9 mil.
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $100,000 - $249,999
11. ☐ None of the above

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

5 Are you involved in the purchase of and/or plan to purchase network products and services?

☐ Yes ☐ No

6 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

LOCAL-AREA NETWORKS
A B
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ Network Op. Sys. Software
☐ 03. ☐ LAN Storage/Backup
☐ 04. ☐ Optical LAN Storage/Backup
☐ 05. ☐ Disk LAN Storage/Backup
☐ 06. ☐ Tape LAN Storage/Backup
☐ 07. ☐ RAID LAN Storage/Backup
☐ 08. ☐ Network Test/Diagnostic Tools
☐ 09. ☐ Cables, Connectors, Baluns
☐ 10. ☐ UPS
☐ 11. ☐ Network Interface Cards
☐ 12. ☐ Peer-to-Peer LANs
☐ 13. ☐ SNMP Network Management
☐ 14. ☐ ATM Switches
☐ 15. ☐ Token-Ring Switches
☐ 16. ☐ Ethernet Switches
☐ 17. ☐ Remote LAN Access/Communications Servers
☐ 18. ☐ Superservers
☐ 19. ☐ File/Application Servers
☐ 20. ☐ Print Servers/Fax Servers
☐ 21. ☐ CD-ROM Servers
☐ 22. ☐ LAN Servers

INTERNETWORKING
A B
☐ 23. ☐ Bridges
☐ 24. ☐ Routers
☐ 25. ☐ Bridge/Router
☐ 26. ☐ Gateways
☐ 27. ☐ Intelligent Hubs
☐ 28. ☐ Stackable Hubs

COMPUTERS/PERIPHERALS
A B
☐ 29. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 30. ☐ Micros/PCs
☐ 31. ☐ Minis
☐ 32. ☐ Mainframes
☐ 33. ☐ Workstations
☐ 34. ☐ Terminals
☐ 35. ☐ Printers/Network Printers
☐ 36. ☐ Cluster Controllers
☐ 37. ☐ CD-ROM
☐ 38. ☐ Fax/Modem Boards

REMOTE/WIRELESS COMPUTING
A B
☐ 39. ☐ PDAs
☐ 40. ☐ PCMCIA Devices
☐ 41. ☐ Wireless Data Services
☐ 42. ☐ Wireless Data Equipment
☐ 43. ☐ Wireless LANs
☐ 44. ☐ Cellular Equipment & Services

INTERNET/INTRANET
A B
☐ 45. ☐ Internet Access Service
☐ 46. ☐ Firewalls/Security
☐ 47. ☐ Web Servers
☐ 48. ☐ Web Browsers
☐ 49. ☐ Intranet Applications/Groupware
☐ 50. ☐ Search Retrieval Products (web crawler)
☐ 51. ☐ Internet Development Tools
☐ 52. ☐ Internet Commerce Tools

SOFTWARE/APPLICATIONS
A B
☐ 53. ☐ Network Management
☐ 54. ☐ Systems Management
☐ 55. ☐ Security
☐ 56. ☐ Communications Software
☐ 57. ☐ Terminal Emulation
☐ 58. ☐ Word Processing

A B SOFTWARE/APPLICATIONS (cont'd)
☐ 59. ☐ Operating Systems
☐ 60. ☐ Client/Server Applications Development
☐ 61. ☐ Database Management/RDBMS
☐ 62. ☐ Spreadsheet
☐ 63. ☐ Groupware
☐ 64. ☐ EDI
☐ 65. ☐ E-mail
☐ 66. ☐ Windows/Graphical User Interface
☐ 67. ☐ Multimedia
☐ 68. ☐ Graphics/DTP
☐ 69. ☐ Remote Access
☐ 70. ☐ Imaging
☐ 71. ☐ Server Suites (Back Office, etc.)
☐ 72. ☐ Suites
☐ 73. ☐ Middleware
☐ 74. ☐ Document Management
☐ 75. ☐ Database Server
☐ 76. ☐ Site Metering Tools
☐ 77. ☐ Computer-Integrated Telephony (CIT)

WIDE-AREA NETWORK EQUIPMENT & SERVICES
A B
☐ 78. ☐ Frame Relay Equip./Services
☐ 79. ☐ Modems
☐ 80. ☐ FT-1/T-1/T-3 Multiplexers
☐ 81. ☐ FT-1/T-1/T-3 Services
☐ 82. ☐ SONET
☐ 83. ☐ Inverse Multiplexers
☐ 84. ☐ SMDS
☐ 85. ☐ Asynchronous Transfer Mode
☐ 86. ☐ Diagnostic/Test Equipment
☐ 87. ☐ DSU/CSU
☐ 88. ☐ VSAT/Satellite
☐ 89. ☐ ISDN Equipment & Services
☐ 90. ☐ PBXs
☐ 91. ☐ Voice Mail/Response
☐ 92. ☐ Videoconferencing
☐ 93. ☐ Leased Lines
☐ 94. ☐ Switched Data
☐ 95. ☐ E-mail
☐ 96. ☐ 800/900/MTS Services
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 107 ☐ None of the above (1-99)

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

NETWORK PROTOCOLS
A B
☐ 01. ☐ SNA
☐ 02. ☐ DECnet
☐ 03. ☐ TCP/IP
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ APPC/APPN/LU 6.2
☐ 06. ☐ NETBIOS
☐ 07. ☐ AppleTalk
☐ 08. ☐ NFS
☐ 09. ☐ IPv6
☐ 10. ☐ SNMP/SNMPv2
☐ 11. ☐ Other *(please specify)*____________

NETWORK OPERATING SYSTEM
A B
☐ 12. ☐ Microsoft (LAN Manager)
☐ 13. ☐ Novell (NetWare 2.X, 3.X)
☐ 14. ☐ Novell (NetWare 4.X)
☐ 15. ☐ Windows NT
☐ 16. ☐ Windows NT/Advanced Server
☐ 17. ☐ LocalTalk (AppleTalk)
☐ 18. ☐ Banyan (VINES)

A B NETWORK OPERATING SYSTEM (cont'd)
☐ 19. ☐ IBM (LAN Server)
☐ 20. ☐ IBM (PC LAN Program)
☐ 21. ☐ Artisoft (LANtastic)
☐ 22. ☐ Digital (Pathworks)
☐ 23. ☐ Other *(please specify)*____________

LAN ENVIRONMENT
A B
☐ 24. ☐ 4M Token Ring
☐ 25. ☐ 16M Token Ring
☐ 26. ☐ Ethernet
☐ 27. ☐ Fast Ethernet
☐ 28. ☐ 100vg Any LAN
☐ 29. ☐ FDDI
☐ 30. ☐ LocalTalk
☐ 31. ☐ 10Base-T
☐ 32. ☐ ATM
☐ 33. ☐ Other *(please specify)*____________

COMPUTER OPERATING SYSTEM
A B
☐ 34. ☐ DOS
☐ 35. ☐ Unix/Xenix/AIX
☐ 36. ☐ OS/2
☐ 37. ☐ OS/2 Warp
☐ 38. ☐ IBM MVS
☐ 39. ☐ IBM VM
☐ 40. ☐ Digital VMS
☐ 41. ☐ Macintosh
☐ 42. ☐ Windows
☐ 43. ☐ Windows 95
☐ 44. ☐ NT
☐ 45. ☐ Solaris
☐ 46. ☐ Other *(please specify)*____________

☐ 47. ☐ None of the above (1-46)

8 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE
(check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT
(check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

9 What is the total number of LANs, workstations/nodes at this location/in your organization?

At this location:			Entire organization:		
	LANs	Workstations/ Nodes		LANs	Workstations/ Nodes
1.	☐ 5,000+	☐	1.	☐ 5,000+	☐
2.	☐ 1,000-4,999	☐	2.	☐ 1,000-4,999	☐
3.	☐ 100-999	☐	3.	☐ 100-999	☐
4.	☐ 50-99	☐	4.	☐ 50-99	☐
5.	☐ 10-49	☐	5.	☐ 10-49	☐
6.	☐ 1-9	☐	6.	☐ 1-9	☐

10 Please indicate your involvement in developing/implementing Internet/Intranet Technologies:

(check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ Implement
6. ☐ None

11 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

Mainframes	A Installed	B Planned
1. IBM	☐	☐
2. Amdahl	☐	☐
3. Cray	☐	☐
4. Hitachi	☐	☐
5. Unisys	☐	☐

Minis	C Installed	D Planned
1. IBM	☐	☐
2. Digital	☐	☐
3. Tandem	☐	☐
4. Unisys	☐	☐
5. AT&T GIS	☐	☐
6. HP	☐	☐
7. Data General	☐	☐

What is the total number of Servers/Clients installed/ planned:
(USE NUMBERS ONLY)

E-AT THIS LOCATION	#	F-% with Internet Access
1. Servers		%
2. Clients		%

G-ENTIRE ORGANIZATION	#	H-% with Internet Access
1. Servers		%
2. Clients		%

Ⓐ

Which of the following Servers/Clients do you have installed/planned:
(CHECK ALL THAT APPLY)

	I-At this location:		J-Entire organization:	
	Servers	Clients	Servers	Clients
01. Power PC	☐	☐	☐	☐
02. Power Mac	☐	☐	☐	☐
03. Mac Other	☐	☐	☐	☐
04. Multi Processor Servers	☐	☐	☐	☐
05. P6	☐	☐	☐	☐
06. Pentium Pro	☐	☐	☐	☐
07. Pentium	☐	☐	☐	☐
08. 486	☐	☐	☐	☐
09. 386	☐	☐	☐	☐
10. 286	☐	☐	☐	☐
11. Risc	☐	☐	☐	☐
12. Other	☐	☐	☐	☐

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 bil. to $9.9 bil.
3. ☐ $500 mil. to $999.9 mil.
4. ☐ $100 mil. to $499.9 mil.
5. ☐ $50 mil. to $99.9 mil.
6. ☐ $10 mil. to $49.9 mil.
7. ☐ $5 mil. to $9.9 mil.
8. ☐ $4.9 mil. or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

Entire organization:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

14 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

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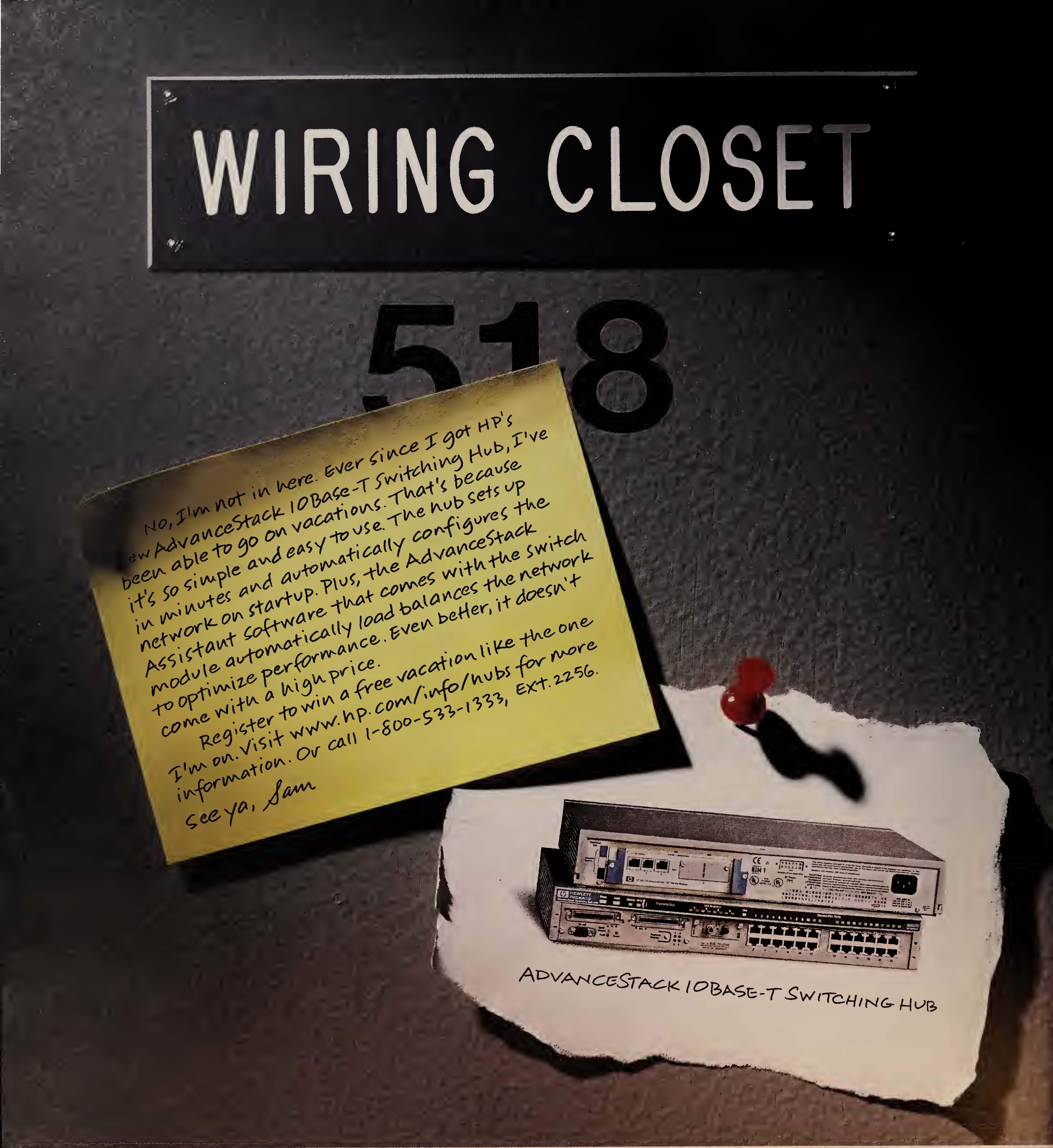

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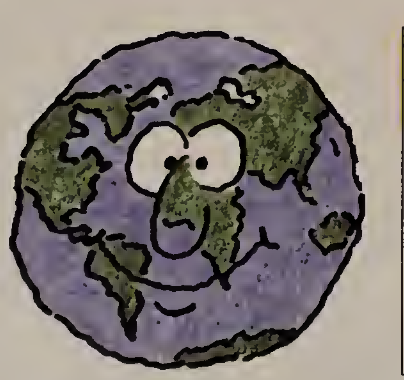

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*__________

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*__________

3 What is the estimated value of networking equipment and services that you help specify, recommend or approve? (check one only)

01. ☐ $100 million or more
02. ☐ $50 mil. - $99.9 mil.
03. ☐ $25 mil. - $49.9 mil.
04. ☐ $20 mil. - $24.9 mil.
05. ☐ $10 mil. - $19.9 mil.
06. ☐ $5 mil. - $9.9 mil.
07. ☐ $1 mil. - $4.9 mil.
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $100,000 - $249,999
11. ☐ None of the above

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

5 Are you involved in the purchase of and/or plan to purchase network products and services?

☐ Yes ☐ No

6 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

LOCAL-AREA NETWORKS
A B
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ Network Op. Sys. Software
☐ 03. ☐ LAN Storage/Backup
☐ 04. ☐ Optical LAN Storage/Backup
☐ 05. ☐ Disk LAN Storage/Backup
☐ 06. ☐ Tape LAN Storage/Backup
☐ 07. ☐ RAID LAN Storage/Backup
☐ 08. ☐ Network Test/Diagnostic Tools
☐ 09. ☐ Cables, Connectors, Baluns
☐ 10. ☐ UPS
☐ 11. ☐ Network Interface Cards
☐ 12. ☐ Peer-to-Peer LANs
☐ 13. ☐ SNMP Network Management
☐ 14. ☐ ATM Switches
☐ 15. ☐ Token-Ring Switches
☐ 16. ☐ Ethernet Switches
☐ 17. ☐ Remote LAN Access/Communications Servers
☐ 18. ☐ Superservers
☐ 19. ☐ File/Application Servers
☐ 20. ☐ Print Servers/Fax Servers
☐ 21. ☐ CD-ROM Servers
☐ 22. ☐ LAN Servers

INTERNETWORKING
A B
☐ 23. ☐ Bridges
☐ 24. ☐ Routers
☐ 25. ☐ Bridge/Router
☐ 26. ☐ Gateways
☐ 27. ☐ Intelligent Hubs
☐ 28. ☐ Stackable Hubs

COMPUTERS/PERIPHERALS
A B
☐ 29. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 30. ☐ Micros/PCs
☐ 31. ☐ Minis
☐ 32. ☐ Mainframes
☐ 33. ☐ Workstations
☐ 34. ☐ Terminals
☐ 35. ☐ Printers/Network Printers
☐ 36. ☐ Cluster Controllers
☐ 37. ☐ CD-ROM
☐ 38. ☐ Fax/Modem Boards

REMOTE/WIRELESS COMPUTING
A B
☐ 39. ☐ PDAs
☐ 40. ☐ PCMCIA Devices
☐ 41. ☐ Wireless Data Services
☐ 42. ☐ Wireless Data Equipment
☐ 43. ☐ Wireless LANs
☐ 44. ☐ Cellular Equipment & Services

INTERNET/INTRANET
A B
☐ 45. ☐ Internet Access Service
☐ 46. ☐ Firewalls/Security
☐ 47. ☐ Web Servers
☐ 48. ☐ Web Browsers
☐ 49. ☐ Intranet Applications/Groupware
☐ 50. ☐ Search Retrieval Products (web crawler)
☐ 51. ☐ Internet Development Tools
☐ 52. ☐ Internet Commerce Tools

SOFTWARE/APPLICATIONS
A B
☐ 53. ☐ Network Management
☐ 54. ☐ Systems Management
☐ 55. ☐ Security
☐ 56. ☐ Communications Software
☐ 57. ☐ Terminal Emulation
☐ 58. ☐ Word Processing
☐ 59. ☐ Operating Systems
☐ 60. ☐ Client/Server Applications Development
☐ 61. ☐ Database Management/RDBMS
☐ 62. ☐ Spreadsheet
☐ 63. ☐ Groupware

SOFTWARE/APPLICATIONS (cont'd)
A B
☐ 64. ☐ EDI
☐ 65. ☐ E-mail
☐ 66. ☐ Windows/Graphical User Interface
☐ 67. ☐ Multimedia
☐ 68. ☐ Graphics/DTP
☐ 69. ☐ Remote Access
☐ 70. ☐ Imaging
☐ 71. ☐ Server Suites (Back office, etc.)
☐ 72. ☐ Suites
☐ 73. ☐ Middleware
☐ 74. ☐ Document Management
☐ 75. ☐ Database Server
☐ 76. ☐ Site Metering Tools
☐ 77. ☐ Computer-Integrated Telephony (CIT)

WIDE-AREA NETWORK EQUIPMENT & SERVICES
A B
☐ 78. ☐ Frame Relay Equip./Services
☐ 79. ☐ Modems
☐ 80. ☐ FT-1/T-1/T-3 Multiplexers
☐ 81. ☐ FT-1/T-1/T-3 Services
☐ 82. ☐ SONET
☐ 83. ☐ Inverse Multiplexers
☐ 84. ☐ SMDS
☐ 85. ☐ Asynchronous Transfer Mode
☐ 86. ☐ Diagnostic/Test Equipment
☐ 87. ☐ DSU/CSU
☐ 88. ☐ VSAT/Satellite
☐ 89. ☐ ISDN Equipment & Services
☐ 90. ☐ PBXs
☐ 91. ☐ Voice Mail/Response
☐ 92. ☐ Videoconferencing
☐ 93. ☐ Leased Lines
☐ 94. ☐ Switched Data
☐ 95. ☐ E-mail
☐ 96. ☐ 800/900/MTS Services
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 107 ☐ None of the above (1-99)

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

NETWORK PROTOCOLS
A B
☐ 01. ☐ SNA
☐ 02. ☐ DECnet
☐ 03. ☐ TCP/IP
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ APPC/APPN/LU 6.2
☐ 06. ☐ NETBIOS
☐ 07. ☐ AppleTalk
☐ 08. ☐ NFS
☐ 09. ☐ IPv6
☐ 10. ☐ SNMP/SNMPv2
☐ 11. ☐ Other *(please specify)*__________

NETWORK OPERATING SYSTEM
A B
☐ 12. ☐ Microsoft (LAN Manager)
☐ 13. ☐ Novell (NetWare 2.X, 3.X)
☐ 14. ☐ Novell (NetWare 4.X)
☐ 15. ☐ Windows NT
☐ 16. ☐ Windows NT/Advanced Server
☐ 17. ☐ LocalTalk (AppleTalk)
☐ 18. ☐ Banyan (VINES)
☐ 19. ☐ IBM (LAN Server)
☐ 20. ☐ IBM (PC LAN Program)
☐ 21. ☐ Artisoft (LANtastic)
☐ 22. ☐ Digital (Pathworks)
☐ 23. ☐ Other *(please specify)*__________

LAN ENVIRONMENT
A B
☐ 24. ☐ 4M Token Ring
☐ 25. ☐ 16M Token Ring
☐ 26. ☐ Ethernet
☐ 27. ☐ Fast Ethernet
☐ 28. ☐ 100vg Any LAN
☐ 29. ☐ FDDI
☐ 30. ☐ LocalTalk
☐ 31. ☐ 10Base-T
☐ 32. ☐ ATM
☐ 33. ☐ Other *(please specify)*__________

COMPUTER OPERATING SYSTEM
A B
☐ 34. ☐ DOS
☐ 35. ☐ Unix/Xenix/AIX
☐ 36. ☐ OS/2
☐ 37. ☐ OS/2 Warp
☐ 38. ☐ IBM MVS
☐ 39. ☐ IBM VM
☐ 40. ☐ Digital VMS
☐ 41. ☐ Macintosh
☐ 42. ☐ Windows
☐ 43. ☐ Windows 95
☐ 44. ☐ NT
☐ 45. ☐ Solaris
☐ 46. ☐ Other *(please specify)*__________

☐ 47. ☐ None of the above (1-46)

8 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)	B. INVOLVEMENT (check all that apply)
1.☐ Corporate/Enterprise	1.☐ Recommend/Specify
2.☐ Department	2.☐ Approve
3.☐ None	3.☐ Evaluate
	4.☐ Determine the need
	5.☐ None

9 What is the total number of LANs, workstations/nodes at this location/in your organization?

At this location:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

Entire organization:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

10 Please indicate your involvement in developing/implementing Internet/Intranet Technologies:

(check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ Implement
6. ☐ None

11 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes	
	A-Installed	B-Planned
1. IBM	☐	☐
2. Amdahl	☐	☐
3. Cray	☐	☐
4. Hitachi	☐	☐
5. Unisys	☐	☐

	Minis	
	C-Installed	D-Planned
1. IBM	☐	☐
2. Digital	☐	☐
3. Tandem	☐	☐
4. Unisys	☐	☐
5. AT&T GIS	☐	☐
6. HP	☐	☐
7. Data General	☐	☐

What is the total number of Servers/Clients installed/planned: (USE NUMBERS ONLY)

E-AT THIS LOCATION	#	F-% with Internet Access
1. Servers		%
2. Clients		%

G-ENTIRE ORGANIZATION	#	H-% with Internet Access
1. Servers		%
2. Clients		%

Which of the following Servers/Clients do you have installed/planned: (CHECK ALL THAT APPLY)

	I-At this location:		J-Entire organization:	
	Servers	Clients	Servers	Clients
01. Power PC	☐	☐	☐	☐
02. Power Mac	☐	☐	☐	☐
03. Mac Other	☐	☐	☐	☐
04. Multi Processor Servers	☐	☐	☐	☐
05. P6	☐	☐	☐	☐
06. Pentium Pro	☐	☐	☐	☐
07. Pentium	☐	☐	☐	☐
08. 486	☐	☐	☐	☐
09. 386	☐	☐	☐	☐
10. 286	☐	☐	☐	☐
11. Risc	☐	☐	☐	☐
12. Other	☐	☐	☐	☐

12 Estimated gross annual revenue of your entire company/ institution: (check one only)

1.☐ $10 bil. or more
2.☐ $1 bil. to $9.9 bil.
3.☐ $500 mil. to $999.9 mil.
4.☐ $100 mil. to $499.9 mil.
5.☐ $50 mil. to $99.9 mil.
6.☐ $10 mil. to $49.9 mil
7.☐ $5 mil. to $9.9 mil.
8.☐ $4.9 mil. or less
9.☐ None of the above

13 Estimated number of employees at this location/ in entire organization:

At this location:	Entire organization:
1. ☐ Over 10,000	1. ☐ Over 10,000
2. ☐ 5,000 - 9,999	2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999	3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499	4. ☐ 1,000 - 2,499
5. ☐ 500 - 999	5. ☐ 500 - 999
6. ☐ 499 or less	6. ☐ 499 or less

14 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

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